# Cisco Intrusion Prevention System Appliance and Module Installation Guide for IPS 7.1

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GLOSSARY

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# About This Guide

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# Contents

This guide describes how to install appliances and modules that support Cisco IPS 7.1. It includes a glossary that contains expanded acronyms and pertinent IPS terms. It is part of the documentation set for Cisco Intrusion Prevention System 7.1. Use this guide in conjunction with the documents listed in Related Documentation, page xv.

This preface contains the following topics:

- Audience, page xiii
- Organization, page xiv
- Conventions, page xiv
- Related Documentation, page xv
- Where to Find Safety and Warning Information, page xv
- Obtaining Documentation, Using the Cisco Bug Search Tool, and Submitting a Service Request, page xvi

# Audience

This guide is for experienced network security administrators who install and maintain Cisco IPS sensors, including the supported IPS appliances and modules.

# Organization

This guide includes the following sections:

| Section | Title | Description |
|---|---|---|
| 1 | "Introducing the Sensor" | Describes IPS appliances and modules. |
| 2 | "Preparing the Appliance for Installation" | Describes how to prepare to install appliances. |
| 3 | "Installing the IPS 4270-20" | Describes how to install the IPS 4270-20. |
| 4 | "Installing the IPS 4345 and IPS 4360" | Describes how to install the IPS 4345 and the IPS 4360. |
| 5 | "Installing the IPS 4510 and IPS 4520" | Describes how to install the IPS 4510 and the IPS 4520. |
| 6 | "Installing and Removing the ASA 5585-X IPS SSP" | Describes how to install the ASA 5585-X IPS SSP. |
| A | "Logging In to the Sensor" | Describes how to log in to the various sensors. |
| B | "Initializing the Sensor" | Describes how to use the **setup** command to initialize sensors. |
| C | "Obtaining Software" | Describes where to go to get the latest IPS software and describes the naming conventions. |
| D | "Upgrading, Downgrading, and Installing System Images" | Describes how to upgrade sensors and reimage the various sensors. |
| E | "Troubleshooting" | Contains troubleshooting tips for IPS hardware and software. |
| F | "Cable Pinouts" | Describes the appliance cable pinouts. |
| | "Glossary" | Contains IPS acronyms and terms. |

# Conventions

This document uses the following conventions:

| Convention | Indication |
|---|---|
| **bold** font | Commands and keywords and user-entered text appear in **bold** font. |
| *italic* font | Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font. |
| [ ] | Elements in square brackets are optional. |
| { x \| y \| z } | Required alternative keywords are grouped in braces and separated by vertical bars. |
| [ x \| y \| z ] | Optional alternative keywords are grouped in brackets and separated by vertical bars. |
| string | A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks. |
| `courier` font | Terminal sessions and information the system displays appear in `courier` font. |

| | |
|---|---|
| < > | Nonprinting characters such as passwords are in angle brackets. |
| [ ] | Default responses to system prompts are in square brackets. |
| !, # | An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line. |

**Note** Means *reader take note*.

**Tip** Means *the following information will help you solve a problem*.

**Caution** Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

**Timesaver** Means *the described action saves time*. You can save time by performing the action described in the paragraph.

**Warning** **Means *reader be warned*. In this situation, you might perform an action that could result in bodily injury.**

# Related Documentation

For a complete list of the Cisco IPS 7.1 documentation and where to find it, refer to the following URL:

http://www.cisco.com/en/US/docs/security/ips/7.1/roadmap/19889_01.html

For a complete list of the Cisco ASA 5500 series documentation and where to find it, refer to the following URL:

http://www.cisco.com/en/US/docs/security/asa/roadmap/asaroadmap.html

# Where to Find Safety and Warning Information

Before installing IPS sensors, read the regulatory compliance and safety information documents. These documents contain important safety information, such as the international agency compliance and safety information for the sensor. It also includes translations of the safety warnings. The following documents apply to the sensors in this document:

- *Regulatory Compliance and Safety Information for the Cisco ASA 5500-X Series Appliances and the Intrusion Prevention System 4300 Series Appliances*
- *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4500 Series Appliance Sensor*

# Obtaining Documentation, Using the Cisco Bug Search Tool, and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at: http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html.

Subscribe to *What's New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.

# Introducing the Sensor

## Contents

This chapter introduces the sensor and provides information you should know before you install the sensor. In this guide, the term *sensor* refers to all models unless noted otherwise. For a complete list of supported sensors and their model numbers, see Supported Sensors, page 1-18.

This chapter contains the following sections:


- How the Sensor Functions, page 1-1
- Supported Sensors, page 1-18
- IPS Appliances, page 1-20
- Time Sources and the Sensor, page 1-22


## How the Sensor Functions

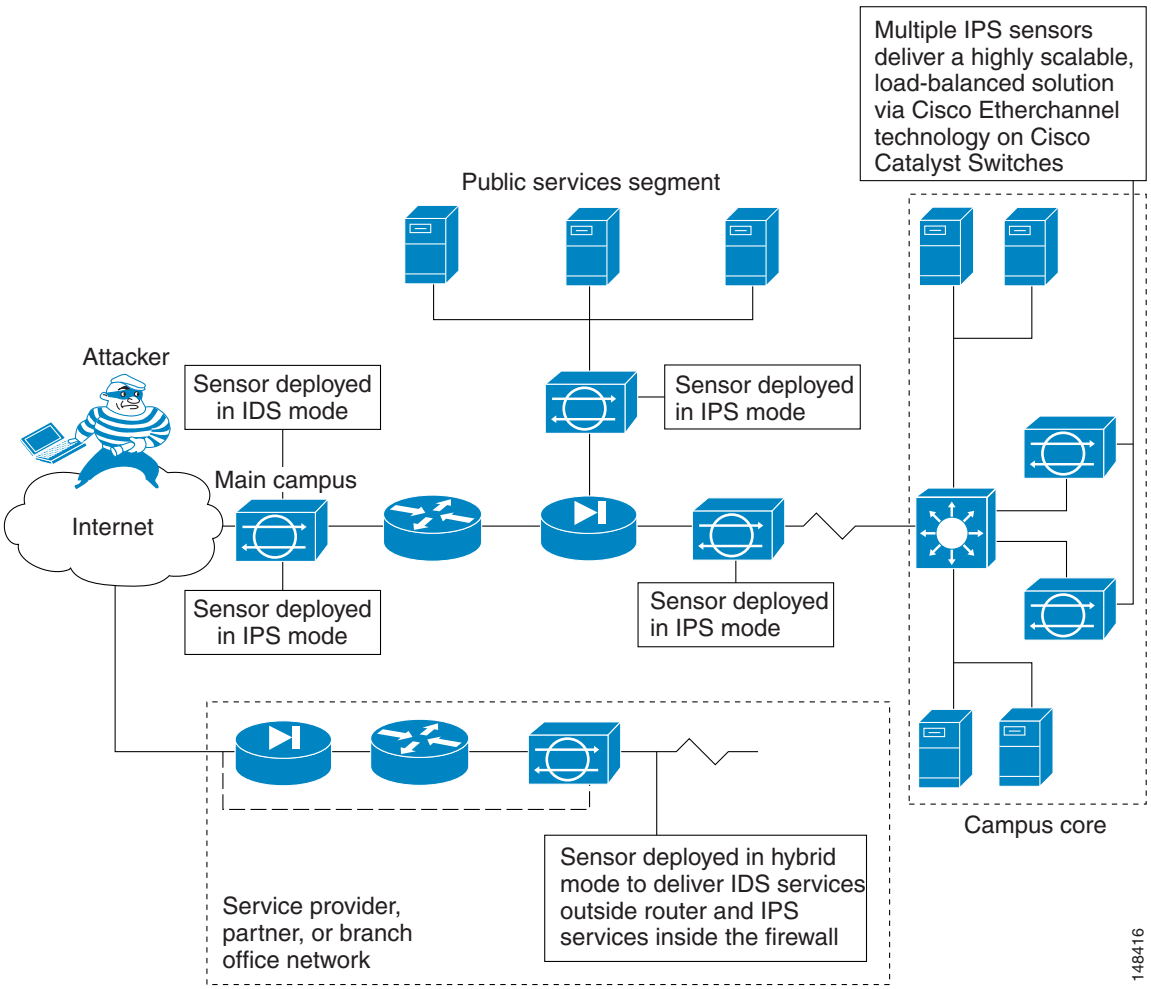
This section describes how the sensor functions, and contains the following topics:


- Capturing Network Traffic, page 1-1
- Your Network Topology, page 1-3
- Correctly Deploying the Sensor, page 1-3
- Tuning the IPS, page 1-3
- Sensor Interfaces, page 1-4
- Interface Modes, page 1-14


### Capturing Network Traffic

The sensor can operate in either promiscuous or inline mode. Figure 1-1 on page 1-2 shows how you can deploy a combination of sensors operating in both inline (IPS) and promiscuous (IDS) modes to protect your network.

*Figure 1-1 Comprehensive Deployment Solutions*


Multiple IPS sensors deliver a highly scalable, load-balanced solution via Cisco Etherchannel technology on Cisco Catalyst Switches
Public services segment
Attacker
Sensor deployed in IDS mode
Sensor deployed in IPS mode
Main campus
Internet
Sensor deployed in IPS mode
Sensor deployed in IPS mode
Campus core
Sensor deployed in hybrid mode to deliver IDS services outside router and IPS services inside the firewall
Service provider, partner, or branch office network
148416

The command and control interface is always Ethernet. This interface has an assigned IP address, which allows it to communicate with the manager workstation or network devices (Cisco switches, routers, and firewalls). Because this interface is visible on the network, you should use encryption to maintain data privacy. SSH is used to protect the CLI and TLS/SSL is used to protect the manager workstation. SSH and TLS/SSL are enabled by default on the manager workstations.

When responding to attacks, the sensor can do the following:

- Insert TCP resets via the sensing interface.

**Note** You should select the TCP reset action only on signatures associated with a TCP-based service. If selected as an action on non-TCP-based services, no action is taken. Additionally, TCP resets are not guaranteed to tear down an offending session because of limitations in the TCP protocol.

- Make ACL changes on switches, routers, and firewalls that the sensor manages.

**Note** ACLs may block only future traffic, not current traffic.

- Generate IP session logs, session replay, and trigger packets display.

  IP session logs are used to gather information about unauthorized use. IP log files are written when events occur that you have configured the appliance to look for.
- Implement multiple packet drop actions to stop worms and viruses.

# Your Network Topology

Before you deploy and configure your sensors, you should understand the following about your network:

- The size and complexity of your network.
- Connections between your network and other networks (and the Internet).
- The amount and type of network traffic on your network.

This knowledge will help you determine how many sensors are required, the hardware configuration for each sensor (for example, the size and type of network interface cards), and how many managers are needed.

# Correctly Deploying the Sensor

You should always position the IPS sensor behind a perimeter-filtering device, such as a firewall or adaptive security appliance. The perimeter device filters traffic to match your security policy thus allowing acceptable traffic in to your network. Correct placement significantly reduces the number of alerts, which increases the amount of actionable data you can use to investigate security violations. If you position the IPS sensor on the edge of your network in front of a firewall, your sensor will produce alerts on every single scan and attempted attack even if they have no significance to your network implementation. You will receive hundreds, thousands, or even millions of alerts (in a large enterprise environment) that are not really critical or actionable in your environment. Analyzing this type of data is time consuming and costly.

# Tuning the IPS

Tuning the IPS ensures that the alerts you see reflect true actionable information. Without tuning the IPS, it is difficult to do security research or forensics on your network because you will have thousands of benign events, also known as false positives. False positives are a by-product of all IPS devices, but they occur much less frequently in Cisco IPS devices since Cisco IPS devices are stateful, normalized, and use vulnerability signatures for attack evaluation. Cisco IPS devices also provide risk rating, which identifies high risk events, and policy-based management, which lets you deploy rules to enforce IPS signature actions based on risk rating.

Follow these tips when tuning your IPS sensors:

- Place your sensor on your network behind a perimeter-filtering device. Proper sensor placement can reduce the number of alerts you need to examine by several thousands a day.
- Deploy the sensor with the default signatures in place.

  The default signature set provides you with a very high security protection posture. The Cisco signature team has spent many hours on testing the defaults to give your sensor the highest protection. If you think that you have lost these defaults, you can restore them.
- Make sure that the event action override is set to drop packets with a risk rating greater than 90. This is the default and ensures that high risk alerts are stopped immediately.

- Filter out known false positives caused by specialized software, such as vulnerability scanner and load balancers by one of the following methods:
  - You can configure the sensor to ignore the alerts from the IP addresses of the scanner and load balancer.
  - You can configure the sensor to allow these alerts and then use the IME to filter out the false positives.
- Filter the Informational alerts.

  These low priority events notifications could indicate that another device is doing reconnaissance on a device protected by the IPS. Research the source IP addresses from these Informational alerts to determine what the source is.
- Analyze the remaining actionable alerts:
  - Research the alert.
  - Fix the attack source.
  - Fix the destination host.
  - Modify the IPS policy to provide more information.

#### For More Information

- For a detailed description of risk rating, refer to Calculating the Risk Rating.
- For information on Cisco signatures, for the IDM and IME refer to Defining Signatures, and for the CLI refer to Defining Signatures.
- For detailed information on event action overrides, for the IDM and IME refer to Configuring Event Action Overrides, and for the CLI, refer to Configuring Event Action Overrides.

# Sensor Interfaces

This section describes the sensor interfaces, and contains the following topics:


- Understanding Sensor Interfaces, page 1-4
- Command and Control Interface, page 1-5
- Sensing Interfaces, page 1-6
- Interface Support, page 1-6
- TCP Reset Interfaces, page 1-11
- Interface Restrictions, page 1-12


## Understanding Sensor Interfaces

The sensor interfaces are named according to the maximum speed and physical location of the interface. The physical location consists of a port number and a slot number. All interfaces that are built-in on the sensor motherboard are in slot 0, and the interface card expansion slots are numbered beginning with slot 1 for the bottom slot with the slot numbers increasing from bottom to top (except for the IPS 4270-20, where the ports are numbered from top to bottom). Each physical interface can be divided in to VLAN group subinterfaces, each of which consists of a group of VLANs on that interface.

There are three interface roles:

- Command and control
- Sensing
- Alternate TCP reset

There are restrictions on which roles you can assign to specific interfaces and some interfaces have multiple roles. You can configure any sensing interface to any other sensing interface as its TCP reset interface. The TCP reset interface can also serve as an IDS (promiscuous) sensing interface at the same time. The following restrictions apply:

- The TCP reset interface that is assigned to a sensing interface has no effect in inline interface or inline VLAN pair mode, because TCP resets are always sent on the sensing interfaces in those modes.
- There is only one sensing interface on the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP and ASA 5585-X IPS SSP), so you cannot designate an alternate TCP reset interface.
- On the IPS 4510 and IPS 4520, no interface-related configurations are allowed when the SensorApp is down.

## Command and Control Interface

The command and control interface has an IP address and is used for configuring the sensor. It receives security and status events from the sensor and queries the sensor for statistics. The command and control interface is permanently enabled. It is permanently mapped to a specific physical interface, which depends on the specific model of sensor. You cannot use the command and control interface as either a sensing or alternate TCP reset interface.

Table 1-1 lists the command and control interfaces for each sensor.

*Table 1-1 Command and Control Interfaces*

| Sensor | Command and Control Interface |
|---|---|
| ASA 5500 AIP SSM-10 | GigabitEthernet 0/0 |
| ASA 5500 AIP SSM-20 | GigabitEthernet 0/0 |
| ASA 5500 AIP SSM-40 | GigabitEthernet 0/0 |
| ASA 5512-X IPS SSP | Management 0/0 |
| ASA 5515-X IPS SSP | Management 0/0 |
| ASA 5525-X IPS SSP | Management 0/0 |
| ASA 5545-X IPS SSP | Management 0/0 |
| ASA 5555-X IPS SSP | Management 0/0 |
| ASA 5585-X IPS SSP-10 | Management 0/0 |
| ASA 5585-X IPS SSP-20 | Management 0/0 |
| ASA 5585-X IPS SSP-40 | Management 0/0 |
| ASA 5585-X IPS SSP-60 | Management 0/0 |
| IPS 4240 | Management 0/0 |
| IPS 4255 | Management 0/0 |

*Table 1-1 Command and Control Interfaces (continued)*

| Sensor | Command and Control Interface |
|---|---|
| IPS 4260 | Management 0/0 |
| IPS 4270-20 | Management 0/0 |
| IPS 4345 | Management 0/0 |
| IPS 4360 | Management 0/0 |
| IPS 4510 | Management 0/0[1] |
| IPS 4520 | Management 0/0[1] |

1. The 4500 series sensors have two management ports, Management 0/0 and Management 0/1, but Management 0/1 is reserved for future use.

## Sensing Interfaces

Sensing interfaces are used by the sensor to analyze traffic for security violations. A sensor has one or more sensing interfaces depending on the sensor. Sensing interfaces can operate individually in promiscuous mode or you can pair them to create inline interfaces.

**Note** On appliances, all sensing interfaces are disabled by default. You must enable them to use them. On modules, the sensing interfaces are permanently enabled.

Some appliances support optional interface cards that add sensing interfaces to the sensor. You must insert or remove these optional cards while the sensor is powered off. The sensor detects the addition or removal of a supported interface card. If you remove an optional interface card, some of the interface configuration is deleted, such as the speed, duplex, description string, enabled/disabled state of the interface, and any inline interface pairings. These settings are restored to their default settings when the card is reinstalled. However, the assignment of promiscuous and inline interfaces to the Analysis Engine is not deleted from the Analysis Engine configuration, but is ignored until those cards are reinserted and you create the inline interface pairs again.

## Interface Support

Table 1-2 describes the interface support for appliances and modules running Cisco IPS.

*Table 1-2 Interface Support*

| Base Chassis | Added Interface Cards | Interfaces Supporting Inline VLAN Pairs (Sensing Ports) | Combinations Supporting Inline Interface Pairs | Interfaces Not Supporting Inline (Command and Control Port) |
|---|---|---|---|---|
| ASA 5500 AIP SSM-10 | — | GigabitEthernet 0/1 by security context instead of VLAN pair or inline interface pair | GigabitEthernet 0/1 by security context instead of VLAN pair or inline interface pair | GigabitEthernet 0/0 |
| ASA 5500 AIP SSM-20 | — | GigabitEthernet 0/1 by security context instead of VLAN pair or inline interface pair | GigabitEthernet 0/1 by security context instead of VLAN pair or inline interface pair | GigabitEthernet 0/0 |

*Table 1-2 Interface Support (continued)*

| Base Chassis | Added Interface Cards | Interfaces Supporting Inline VLAN Pairs (Sensing Ports) | Combinations Supporting Inline Interface Pairs | Interfaces Not Supporting Inline (Command and Control Port) |
|---|---|---|---|---|
| ASA 5500 AIP SSM-40 | — | GigabitEthernet 0/1 by security context instead of VLAN pair or inline interface pair | GigabitEthernet 0/1 by security context instead of VLAN pair or inline interface pair | GigabitEthernet 0/0 |
| ASA 5512-X IPS SSP | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5515-X IPS SSP | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5525-X IPS SSP | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5545-X IPS SSP | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5555-X IPS SSP | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5585-X IPS SSP-10 | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5585-X IPS SSP-20 | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5585-X IPS SSP-40 | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| ASA 5585-X IPS SSP-60 | — | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | PortChannel 0/0 by security context instead of VLAN pair or inline interface pair | Management 0/0 |
| IPS 4240 | — | GigabitEthernet 0/0<br>GigabitEthernet 0/1<br>GigabitEthernet 0/2<br>GigabitEthernet 0/3 | 0/0<->0/1<br>0/0<->0/2<br>0/0<->0/3<br>0/1<->0/2<br>0/1<->0/3<br>0/2<->0/3 | Management 0/0 |

*Table 1-2 Interface Support (continued)*

| Base Chassis | Added Interface Cards | Interfaces Supporting Inline VLAN Pairs (Sensing Ports) | Combinations Supporting Inline Interface Pairs | Interfaces Not Supporting Inline (Command and Control Port) |
|---|---|---|---|---|
| IPS 4255 | — | GigabitEthernet 0/0<br>GigabitEthernet 0/1<br>GigabitEthernet 0/2<br>GigabitEthernet 0/3 | 0/0<->0/1<br>0/0<->0/2<br>0/0<->0/3<br>0/1<->0/2<br>0/1<->0/3<br>0/2<->0/3 | Management 0/0 |
| IPS 4260 | — | GigabitEthernet 0/1 | N/A | Management 0/0 |
| IPS 4260 | 4GE-BP<br><br>Slot 1<br><br><br><br><br>Slot 2 | GigabitEthernet 0/1<br><br>GigabitEthernet 2/0<br>GigabitEthernet 2/1<br>GigabitEthernet 2/2<br>GigabitEthernet 2/3<br><br>GigabitEthernet 3/0<br>GigabitEthernet 3/1<br>GigabitEthernet 3/2<br>GigabitEthernet 3/3 | <br><br>2/0<->2/1[1]<br>2/2<->2/3<br><br><br><br>3/0<->3/1<br>3/2<->3/3 | Management 0/0 |
| IPS 4260 | 2SX<br><br>Slot 1<br><br><br>Slot 2 | GigabitEthernet 0/1<br><br>GigabitEthernet 2/0<br>GigabitEthernet 2/1<br><br>GigabitEthernet 3/0<br>GigabitEthernet 3/1 | All sensing ports can be paired together | Management 0/0 |
| IPS 4260 | 10GE<br><br>Slot 1 | GigabitEthernet 0/1<br><br>TenGigabitEthernet 2/0<br>TenGigabitEthernet 2/1 | <br><br>2/0<->2/1[2] | Management 0/0 |
| IPS 4270-20 | — | — | N/A | Management 0/0<br>Management 0/1[3] |
| IPS 4270-20 | 4GE-BP<br><br>Slot 1<br><br><br><br><br>Slot 2 | <br><br>GigabitEthernet 3/0<br>GigabitEthernet 3/1<br>GigabitEthernet 3/2<br>GigabitEthernet 3/3<br><br>GigabitEthernet 4/0<br>GigabitEthernet 4/1<br>GigabitEthernet 4/2<br>GigabitEthernet 4/3 | <br><br>3/0<->3/1[4]<br>3/2<->3/3<br><br><br><br>4/0<->4/1<br>4/2<->4/3 | Management 0/0<br>Management 0/1[4] |

*Table 1-2 Interface Support (continued)*

| Base Chassis | Added Interface Cards | Interfaces Supporting Inline VLAN Pairs (Sensing Ports) | Combinations Supporting Inline Interface Pairs | Interfaces Not Supporting Inline (Command and Control Port) |
|---|---|---|---|---|
| IPS 4270-20 | 2SX<br><br>Slot 1<br><br><br>Slot 2 | <br><br>GigabitEthernet 3/0<br>GigabitEthernet 3/1<br><br>GigabitEthernet 4/0<br>GigabitEthernet 4/1 | All sensing ports can be paired together | Management 0/0<br>Management 0/1[4] |
| IPS 4270-20 | 10GE<br><br>Slot 1<br><br><br>Slot 2 | <br><br>TenGigabitEthernet 5/0<br>TenGigabitEthernet 5/1<br><br>TenGigabitEthernet 7/0<br>TenGigabitEthernet 7/1 | All sensing ports can be paired together | Management 0/0<br>Management 0/1[4] |
| IPS 4345 | — | GigabitEthernet 0/0<br>GigabitEthernet 0/1<br>GigabitEthernet 0/2<br>GigabitEthernet 0/3<br>GigabitEthernet 0/4<br>GigabitEthernet 0/5<br>GigabitEthernet 0/6<br>GigabitEthernet 0/7 | All sensing ports can be paired together | Management 0/0<br>Management 0/1[5] |
| IPS 4360 | — | GigabitEthernet 0/0<br>GigabitEthernet 0/1<br>GigabitEthernet 0/2<br>GigabitEthernet 0/3<br>GigabitEthernet 0/4<br>GigabitEthernet 0/5<br>GigabitEthernet 0/6<br>GigabitEthernet 0/7 | All sensing ports can be paired together | Management 0/0<br>Management 0/1[5] |

*Table 1-2 Interface Support (continued)*

| Base Chassis | Added Interface Cards | Interfaces Supporting Inline VLAN Pairs (Sensing Ports) | Combinations Supporting Inline Interface Pairs | Interfaces Not Supporting Inline (Command and Control Port) |
|---|---|---|---|---|
| IPS 4510 | — | GigabitEthernet 0/0<br>GigabitEthernet 0/1<br>GigabitEthernet 0/2<br>GigabitEthernet 0/3<br>GigabitEthernet 0/4<br>GigabitEthernet 0/5<br>TenGigabitEthernet 0/6<br>TenGigabitEthernet 0/7<br>TenGigabitEthernet 0/8<br>TenGigabitEthernet 0/9 | All sensing ports can be paired together | Management 0/0<br>Management 0/1[6] |
| IPS 4520 | —TX | GigabitEthernet 0/0<br>GigabitEthernet 0/1<br>GigabitEthernet 0/2<br>GigabitEthernet 0/3<br>GigabitEthernet 0/4<br>GigabitEthernet 0/5<br>TenGigabitEthernet 0/6<br>TenGigabitEthernet 0/7<br>TenGigabitEthernet 0/8<br>TenGigabitEthernet 0/9 | All sensing ports can be paired together | Management 0/0<br>Management 0/1[6] |

1. To disable hardware bypass, pair the interfaces in any other combination (2/0<->2/2 and 2/1<->2/3, for example).
2. To disable hardware bypass, pair the interfaces in any other combination (2/0<->2/2 and 2/1<->2/3, for example).
3. Reserved for future use.
4. To disable hardware bypass, pair the interfaces in any other combination (2/0<->2/2 and 2/1<->2/3, for example).
5. Does not currently support hardware bypass.
6. Reserved for future use.

**Note** The IPS 4260 supports a mixture of 4GE-BP, 2SX, and 10GE cards. The IPS 4270-20 supports a mixture of 4GE-BP, 2SX, and 10GE cards up to a total of either six cards, or sixteen total ports, which ever is reached first, but is limited to only two 10GE card in the mix of cards.

# TCP Reset Interfaces

This section explains the TCP reset interfaces and when to use them. It contains the following topics:


- Understanding Alternate TCP Reset Interfaces, page 1-11
- Designating the Alternate TCP Reset Interface, page 1-12


## Understanding Alternate TCP Reset Interfaces

**Note** The alternate TCP reset interface setting is ignored in inline interface or inline VLAN pair mode, because resets are sent inline in these modes.

You can configure sensors to send TCP reset packets to try to reset a network connection between an attacker host and its intended target host. In some installations when the interface is operating in promiscuous mode, the sensor may not be able to send the TCP reset packets over the same sensing interface on which the attack was detected. In such cases, you can associate the sensing interface with an alternate TCP reset interface and any TCP resets that would otherwise be sent on the sensing interface when it is operating in promiscuous mode are instead sent out on the associated alternate TCP reset interface.

If a sensing interface is associated with an alternate TCP reset interface, that association applies when the sensor is configured for promiscuous mode but is ignored when the sensing interface is configured for inline mode. any sensing interface can serve as the alternate TCP reset interface for another sensing interface.

**Note** There is only one sensing interface on the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP), so you cannot designate an alternate TCP reset interface.

Table 1-3 lists the alternate TCP reset interfaces.

*Table 1-3 Alternate TCP Reset Interfaces*

| Sensor | Alternate TCP Reset Interface |
|---|---|
| ASA 5500 AIP SSM-10 | None |
| ASA 5500 AIP SSM-20 | None |
| ASA 5500 AIP SSM-40 | None |
| ASA 5512-X IPS SSP | None |
| ASA 5515-X IPS SSP | None |
| ASA 5525-X IPS SSP | None |
| ASA 5545-X IPS SSP | None |
| ASA 5555-X IPS SSP | None |
| ASA 5585-X IPS SSP-10 | None |
| ASA 5585-X IPS SSP-20 | None |
| ASA 5585-X IPS SSP-40 | None |
| ASA 5585-X IPS SSP-60 | None |

*Table 1-3 Alternate TCP Reset Interfaces (continued)*

| Sensor | Alternate TCP Reset Interface |
|---|---|
| IPS 4240 | Any sensing interface |
| IPS 4255 | Any sensing interface |
| IPS 4260 | Any sensing interface |
| IPS 4270-20 | Any sensing interface |
| IPS 4345 | Any sensing interface |
| IPS 4360 | Any sensing interface |
| IPS 4510 | Any sensing interface |
| IPS 4520 | Any sensing interface |

### Designating the Alternate TCP Reset Interface

**Note** There is only one sensing interface on the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP), so you cannot designate an alternate TCP reset interface.

You need to designate an alternate TCP reset interface in the following situations:

- When a switch is being monitored with either SPAN or VACL capture and the switch does not accept incoming packets on the SPAN or VACL capture port.
- When a switch is being monitored with either SPAN or VACL capture for multiple VLANs, and the switch does not accept incoming packets with 802.1q headers. The TCP resets need 802.1q headers to tell which VLAN the resets should be sent on.
- When a network tap is used for monitoring a connection. Taps do not permit incoming traffic from the sensor.

**Caution** You can only assign a sensing interface as an alternate TCP reset interface. You cannot configure the management interface as an alternate TCP reset interface.

## Interface Restrictions

The following restrictions apply to configuring interfaces on the sensor:

- Physical Interfaces
  - In IPS 7.1, rx/tx flow control is disabled on the IPS 4200 series sensors. This is a change from IPS 7.0 where rx/tx flow control is enabled by default.
  - On the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) all backplane interfaces have fixed speed, duplex, and state settings. These settings are protected in the default configuration on all backplane interfaces.
  - For nonbackplane FastEthernet interfaces the valid speed settings are 10 Mbps, 100 Mbps, and auto. Valid duplex settings are full, half, and auto.

  - For Gigabit copper interfaces (1000-TX on the IPS 4240, IPS 4255, IPS 4260, IPS 4270-20,, IPS 4345, IPS 4360, IPS 4510, and IPS 4520), valid speed settings are 10 Mbps, 100 Mbps, 1000 Mbps, and auto. Valid duplex settings are full, half, and auto.
  - For Gigabit (copper or fiber) interfaces, if the speed is configured for 1000 Mbps, the only valid duplex setting is auto.
  - The command and control interface cannot also serve as a sensing interface.
- Inline Interface Pairs
  - Inline interface pairs can contain any combination of sensing interfaces regardless of the physical interface type (copper versus fiber), speed, or duplex settings of the interface. However, pairing interfaces of different media type, speeds, and duplex settings may not be fully tested or supported.
  - The command and control interface cannot be a member of an inline interface pair.
  - You cannot pair a physical interface with itself in an inline interface pair.
  - A physical interface can be a member of only one inline interface pair.
  - You can only configure bypass mode and create inline interface pairs on sensor platforms that support inline mode.
  - A physical interface cannot be a member of an inline interface pair unless the subinterface mode of the physical interface is **none**.
- You can configure the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) to operate inline even though they have only one sensing interface.
- Inline VLAN Pairs
  - You cannot pair a VLAN with itself.
  - You cannot use the default VLAN as one of the paired VLANs in an inline VLAN pair.
  - For a given sensing interface, a VLAN can be a member of only one inline VLAN pair. However, a given VLAN can be a member of an inline VLAN pair on more than one sensing interface.
  - The order in which you specify the VLANs in an inline VLAN pair is not significant.
  - A sensing interface in Inline VLAN Pair mode can have from 1 to 255 inline VLAN pairs.
  - The ASA IPS modules (ASA 5500 AIP SSM ,ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) do not support inline VLAN pairs.
  - For the IPS 4510 and IPS 4520, the maximum number of inline VLAN pairs you can create system wide is 150. On all other platforms, the limit is 255 per interface.
- Alternate TCP Reset Interface
  - You can only assign the alternate TCP reset interface to a sensing interface. You cannot configure the command and control interface as an alternate TCP reset interface. The alternate TCP reset interface option is set to **none** as the default and is protected for all interfaces except the sensing interfaces.
  - You can assign the same physical interface as an alternate TCP reset interface for multiple sensing interfaces.
  - A physical interface can serve as both a sensing interface and an alternate TCP reset interface.
  - The command and control interface cannot serve as the alternate TCP reset interface for a sensing interface.
  - A sensing interface cannot serve as its own alternate TCP reset interface.

  - You can only configure interfaces that are capable of TCP resets as alternate TCP reset interfaces.
  - There is only one sensing interface on the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP), so you cannot designate an alternate TCP reset interface.
- VLAN Groups
  - You can configure any single interface for promiscuous, inline interface pair, or inline VLAN pair mode, but no combination of these modes is allowed.
  - You cannot add a VLAN to more than one group on each interface.
  - You cannot add a VLAN group to multiple virtual sensors.
  - An interface can have no more than 255 user-defined VLAN groups.
  - When you pair a physical interface, you cannot subdivide it; you can subdivide the pair.
  - You can use a VLAN on multiple interfaces; however, you receive a warning for this configuration.
  - You can assign a virtual sensor to any combination of one or more physical interfaces and inline VLAN pairs, subdivided or not.
  - You can subdivide both physical and logical interfaces into VLAN groups.
  - The CLI, IDM, and IME prompt you to remove any dangling references. You can leave the dangling references and continue editing the configuration.
  - The CLI, IDM, and IME do not allow configuration changes in Analysis Engine that conflict with the interface configuration.
  - The CLI allows configuration changes in the interface configuration that cause conflicts in the Analysis Engine configuration. The IDM and IME do *not* allow changes in the interface configuration that cause conflicts in the Analysis Engine configuration.
  - The ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) do not support VLAN groups mode.

# Interface Modes

The following section describes the interface modes, and contains the following topics:


- Promiscuous Mode, page 1-14
- IPv6, Switches, and Lack of VACL Capture, page 1-15
- Inline Interface Pair Mode, page 1-16
- Inline VLAN Pair Mode, page 1-16
- VLAN Group Mode, page 1-17
- Deploying VLAN Groups, page 1-18


## Promiscuous Mode

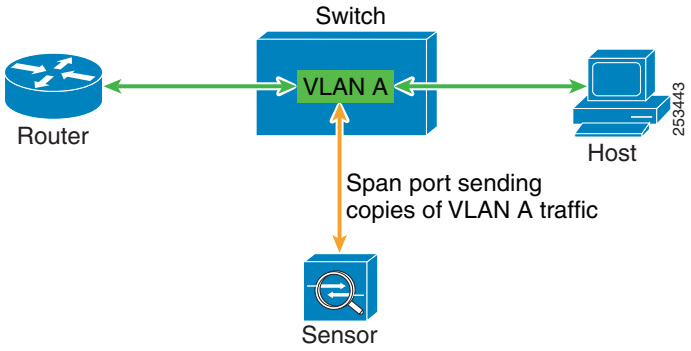
In promiscuous mode, packets do not flow through the sensor. The sensor analyzes a copy of the monitored traffic rather than the actual forwarded packet. The advantage of operating in promiscuous mode is that the sensor does not affect the packet flow with the forwarded traffic. The disadvantage of operating in promiscuous mode, however, is the sensor cannot stop malicious traffic from reaching its

intended target for certain types of attacks, such as atomic attacks (single-packet attacks). The response actions implemented by promiscuous sensor devices are post-event responses and often require assistance from other networking devices, for example, routers and firewalls, to respond to an attack. While such response actions can prevent some classes of attacks, in atomic attacks the single packet has the chance of reaching the target system before the promiscuous-based sensor can apply an ACL modification on a managed device (such as a firewall, switch, or router).

By default, all sensing interfaces are in promiscuous mode. To change an interface from inline interface mode to promiscuous mode, delete any inline interface that contains that interface and delete any inline VLAN pair subinterfaces of that interface from the interface configuration.

Figure 1-2 illustrates promiscuous mode:

***Figure 1-2 Promiscuous Mode***




## IPv6, Switches, and Lack of VACL Capture

VACLs on Catalyst switches do not have IPv6 support. The most common method for copying traffic to a sensor configured in promiscuous mode is to use VACL capture. If you want to have IPv6 support, you can use SPAN ports.

However, you can only configure up to two monitor sessions on a switch unless you use the following configuration:

- Monitor session
- Multiple trunks to one or more sensors
- Restrict per trunk port which VLANs are allowed to perform monitoring of many VLANs to more than two different sensors or virtual sensors within one IPS

The following configuration uses one SPAN session to send all of the traffic on any of the specified VLANs to all of the specified ports. Each port configuration only allows a particular VLAN or VLANs to pass. Thus you can send data from different VLANs to different sensors or virtual sensors all with one SPAN configuration line:

```
clear trunk 4/1-4 1-4094
set trunk 4/1 on dot1q 930
set trunk 4/2 on dot1q 932
set trunk 4/3 on dot1q 960
set trunk 4/4 on dot1q 962
set span 930, 932, 960, 962 4/1-4 both
```

**Note** The SPAN/Monitor configuration is valuable when you want to assign different IPS policies per VLAN or when you have more bandwidth to monitor than one interface can handle.

#### For More Information

For more information on promiscuous mode, see Promiscuous Mode, page 1-14.

## Inline Interface Pair Mode

Operating in inline interface pair mode puts the IPS directly into the traffic flow and affects packet-forwarding rates making them slower by adding latency. This allows the sensor to stop attacks by dropping malicious traffic before it reaches the intended target, thus providing a protective service. Not only is the inline device processing information on Layers 3 and 4, but it is also analyzing the contents and payload of the packets for more sophisticated embedded attacks (Layers 3 to 7). This deeper analysis lets the system identify and stop and/or block attacks that would normally pass through a traditional firewall device.

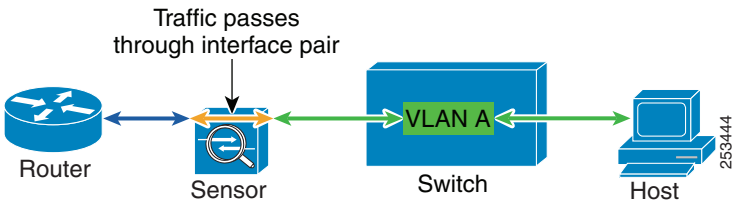
In inline interface pair mode, a packet comes in through the first interface of the pair on the sensor and out the second interface of the pair. The packet is sent to the second interface of the pair unless that packet is being denied or modified by a signature.

**Note** You can configure the ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) to operate inline even though they have only one sensing interface.

**Note** If the paired interfaces are connected to the same switch, you should configure them on the switch as access ports with different access VLANs for the two ports. Otherwise, traffic does not flow through the inline interface.

Figure 1-3 illustrates inline interface pair mode:

***Figure 1-3 Inline Interface Pair Mode***




## Inline VLAN Pair Mode

**Note** The ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) do not support inline VLAN pairs.

**Note** For the IPS 4510 and IPS 4520, the maximum number of inline VLAN pairs you can create systemwide is 150. On all other platforms, the limit is 255 per interface.

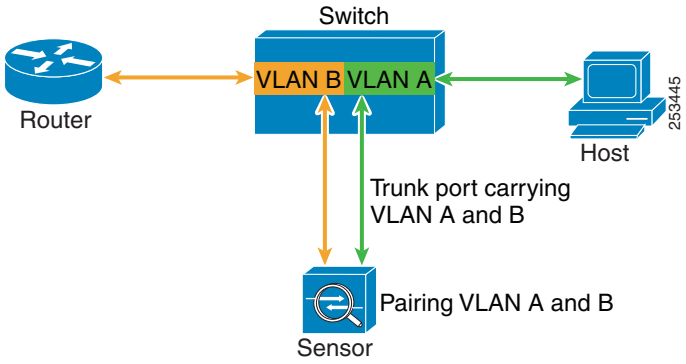
You can associate VLANs in pairs on a physical interface. This is known as inline VLAN pair mode. Packets received on one of the paired VLANs are analyzed and then forwarded to the other VLAN in the pair.

Inline VLAN pair mode is an active sensing mode where a sensing interface acts as an 802.1q trunk port, and the sensor performs VLAN bridging between pairs of VLANs on the trunk. The sensor inspects the traffic it receives on each VLAN in each pair, and can either forward the packets on the other VLAN in the pair, or drop the packet if an intrusion attempt is detected. You can configure an IPS sensor to simultaneously bridge up to 255 VLAN pairs on each sensing interface. The sensor replaces the VLAN ID field in the 802.1q header of each received packet with the ID of the egress VLAN on which the sensor forwards the packet. The sensor drops all packets received on any VLANs that are not assigned to inline VLAN pairs.

**Note** You cannot use the default VLAN as one of the paired VLANs in an inline VLAN pair.

Figure 1-4 illustrates inline VLAN pair mode:

***Figure 1-4 Inline VLAN Pair Mode***




## VLAN Group Mode

**Note** The ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) do not support VLAN groups mode.

You can divide each physical interface or inline interface into VLAN group subinterfaces, each of which consists of a group of VLANs on that interface. Analysis Engine supports multiple virtual sensors, each of which can monitor one or more of these interfaces. This lets you apply multiple policies to the same sensor. The advantage is that now you can use a sensor with only a few interfaces as if it had many interfaces.

**Note** You cannot divide physical interfaces that are in inline VLAN pairs into VLAN groups.

VLAN group subinterfaces associate a set of VLANs with a physical or inline interface. No VLAN can be a member of more than one VLAN group subinterface. Each VLAN group subinterface is identified by a number between 1 and 255. Subinterface 0 is a reserved subinterface number used to represent the entire unvirtualized physical or logical interface. You cannot create, delete, or modify subinterface 0 and no statistics are reported for it.

An unassigned VLAN group is maintained that contains all VLANs that are not specifically assigned to another VLAN group. You cannot directly specify the VLANs that are in the unassigned group. When a VLAN is added to or deleted from another VLAN group subinterface, the unassigned group is updated.

Packets in the native VLAN of an 802.1q trunk do not normally have 802.1q encapsulation headers to identify the VLAN number to which the packets belong. A default VLAN variable is associated with each physical interface and you should set this variable to the VLAN number of the native VLAN or to 0. The value 0 indicates that the native VLAN is either unknown or you do not care if it is specified. If the default VLAN setting is 0, the following occurs:

- Any alerts triggered by packets without 802.1q encapsulation have a VLAN value of 0 reported in the alert.
- Non-802.1q encapsulated traffic is associated with the unassigned VLAN group and it is not possible to assign the native VLAN to any other VLAN group.

**Note** You can configure a port on a switch as either an access port or a trunk port. On an access port, all traffic is in a single VLAN is called the access VLAN. On a trunk port, multiple VLANs can be carried over the port, and each packet has a special header attached called the 802.1q header that contains the VLAN ID. This header is commonly referred as the VLAN tag. However, a trunk port has a special VLAN called the native VLAN. Packets in the native VLAN do not have the 802.1q headers attached.

## Deploying VLAN Groups

Because a VLAN group of an inline pair does not translate the VLAN ID, an inline paired interface must exist between two switches to use VLAN groups on a logical interface. For an appliance, you can connect the two pairs to the same switch, make them access ports, and then set the access VLANs for the two ports differently. In this configuration, the sensor connects between two VLANs, because each of the two ports is in access mode and carries only one VLAN. In this case the two ports must be in different VLANs, and the sensor bridges the two VLANs, monitoring any traffic that flows between the two VLANs.

You can also connect appliances between two switches. There are two variations. In the first variation, the two ports are configured as access ports, so they carry a single VLAN. In this way, the sensor bridges a single VLAN between the two switches.

In the second variation, the two ports are configured as trunk ports, so they can carry multiple VLANs. In this configuration, the sensor bridges multiple VLANs between the two switches. Because multiple VLANs are carried over the inline interface pair, the VLANs can be divided into groups and each group can be assigned to a virtual sensor.

# Supported Sensors

**Caution** Installing the most recent software on unsupported sensors may yield unpredictable results. We do not support software installed on unsupported platforms.

The currently supported IPS 7.1(*x*) versions are 7.1(1)E4, 7.1(2)E4, 7.1(3)E4, 7.1(4)E4, 7.1(5)E4, and IPS 7.1(6)E4. All IPS sensors are not supported in each 7.1(*x*) version. For a list of the specific IPS filenames and the IPS versions that each sensor supports, refer to the Release Notes for your IPS version found at this URL:

http://www.cisco.com/en/US/products/hw/vpndevc/ps4077/prod_release_notes_list.html

Table 1-4 lists the sensors (IPS appliances and modules) that are supported by Cisco IPS.

***Table 1-4 Supported Sensors***

| Model Name | Part Number | Optional Interfaces |
|---|---|---|
| **Appliances** | | |
| IPS 4240 | IPS-4240-K9<br>IPS-4240-DC-K9[1] | —<br>— |
| IPS 4255 | IPS-4255-K9 | — |
| IPS 4260 | IPS-4260-K9<br><br><br><br>IPS-4260-4GE-BP-K9<br>IPS-4260-2SX-K9<br>IPS-4260-2X10GE-SR-K9 | IPS-4GE-BP-INT=<br>IPS-2SX-INT=<br>IPS-2X10GE-SR-INT=<br><br>—<br>—<br>— |
| IPS 4270-20 | IPS-4270-K9<br><br><br><br>IPS-4270-4GE-BP-K9<br>IPS-4270-2SX-K9<br>IPS-4270-2X10GE-SR-K9 | IPS-4GE-BP-INT=<br>IPS-2SX-INT=<br>IPS-2X10GE-SR-INT=<br><br>—<br>—<br>— |
| IPS 4345 | IPS-4345-K9 | — |
| IPS 4360 | IPS-4360-K9 | — |
| IPS 4510 | IPS 4510-K9 | — |
| IPS 4520 | IPS 4520-K9 | — |
| **Modules** | | |
| ASA 5500 AIP SSM-10 | ASA-SSM-AIP-10-K9 | — |
| ASA 5500 AIP SSM-20 | ASA-SSM-AIP-20-K9 | — |
| ASA 5500 AIP SSM-40 | ASA-SSM-AIP-40-K9 | — |
| ASA 5512-X | ASA5512-K7<br>ASA5512-K8<br>ASA5512-DC-K8 | ASA-IC-6GE-CU-A=<br>ASA-IC-6GE-SFP-A= |
| ASA 5515-X | ASA5515-K7<br>ASA5515-K8<br>ASA5515-DC<br>ASA5515-DC-K8 | ASA-IC-6GE-CU-A=<br>ASA-IC-6GE-SFP-A= |

*Table 1-4 Supported Sensors (continued)*

| Model Name | Part Number | Optional Interfaces |
|---|---|---|
| **Appliances** | | |
| ASA 5525-X | ASA5525-K7<br>ASA5525-K8<br>ASA5525-K9<br>ASA5525-DC | ASA-IC-6GE-CU-B=<br>ASA-IC-6GE-SFP-B= |
| ASA 5545-X | ASA5545-K7<br>ASA5545-K8<br>ASA5545-K9<br>ASA5545-DC-K8<br>ASA5545-CU-2AC-K9 | ASA-IC-6GE-CU-C=<br>ASA-IC-6GE-SFP-C= |
| ASA 5555-X | ASA5555-K8<br>ASA5555-CU-2AC-K9 | ASA-IC-6GE-CU-C=<br>ASA-IC-6GE-SFP-C= |
| ASA 5585-X IPS SSP-10 | ASA-SSP-IPS10-K9 | — |
| ASA 5585-X IPS SSP-20 | ASA-SSP-IPS20-K9 | — |
| ASA 5585-X IPS SSP-40 | ASA-SSP-IPS40-K9 | — |
| ASA 5585-X IPS SSP-60 | ASA-SSP-IPS60-K9 | — |

1. IPS-4240-DC-K9 is a NEBS-compliant product.

#### For More Information

For instructions on how to obtain the most recent Cisco IPS software, see Obtaining Cisco IPS Software, page C-1.

# IPS Appliances

This section describes the Cisco appliance, and contains the following topics:


- Introducing the IPS Appliance, page 1-20
- Appliance Restrictions, page 1-21
- Connecting an Appliance to a Terminal Server, page 1-22


## Introducing the IPS Appliance

**Note** The currently supported Cisco IPS appliances are the IPS 4240, IPS 4255, and IPS 4260 [IPS 7.0(x) and later and IPS 7.1(5) and later], IPS 4270-20 [IPS 7.1(3) and later], IPS 4345 and IPS 4360 [IPS 7.1(3) and later], and IPS 4510 and IPS 4520 [IPS 7.1(4) and later].

The IPS appliance is a high-performance, plug-and-play device. The appliance is a component of the IPS, a network-based, real-time intrusion prevention system. You can use the IPS CLI, IDM, IME, ASDM, or CSM to configure the appliance. For a list of IPS documents and how to access them, refer to *Documentation Roadmap for Cisco Intrusion Prevention System 7.1*.

You can configure the appliance to respond to recognized signatures as it captures and analyzes network traffic. These responses include logging the event, forwarding the event to the manager, performing a TCP reset, generating an IP log, capturing the alert trigger packet, and reconfiguring a router. The appliance offers significant protection to your network by helping to detect, classify, and stop threats including worms, spyware and adware, network viruses, and application abuse.

After being installed at key points in the network, the appliance monitors and performs real-time analysis of network traffic by looking for anomalies and misuse based on an extensive, embedded signature library. When the system detects unauthorized activity, appliances can terminate the specific connection, permanently block the attacking host, log the incident, and send an alert to the manager. Other legitimate connections continue to operate independently without interruption.

Appliances are optimized for specific data rates and are packaged in Ethernet, Fast Ethernet, and Gigabit Ethernet configurations. In switched environments, appliances must be connected to the SPAN port or VACL capture port of the switch.

The Cisco IPS appliances provide the following:

- Protection of multiple network subnets through the use of up to eight interfaces
- Simultaneous, dual operation in both promiscuous and inline modes
- A wide array of performance options—from 80 Mbps to multiple gigabits
- Embedded web-based management solutions packaged with the sensor

### For More Information

- For a list of supported appliances, see Supported Sensors, page 1-18.
- For a description of the IPS 4240 and IPS 4255, see Chapter 3, “Installing the IPS 4240 and IPS 4255.”
- For a description of the IPS 4270-20, see Chapter 3, “Installing the IPS 4270-20.”
- For a description of the IPS 4345 and IPS 4360, see Chapter 4, “Installing the IPS 4345 and IPS 4360.”
- For a description of the IPS 4510 and IPS 4520, see Chapter 5, “Installing the IPS 4510 and IPS 4520.”
- For a description of the ASA 5500 AIP SSM, see Chapter 6, “Installing and Removing the ASA 5500 AIP SSM.”
- For a description of the ASA 5585-X IPS SSP, see Chapter 7, “Installing and Removing the ASA 5585-X IPS SSP.”

# Appliance Restrictions

The following restrictions apply to using and operating the appliance:

- The appliance is not a general purpose workstation.
- Cisco Systems prohibits using the appliance for anything other than operating Cisco IPS.
- Cisco Systems prohibits modifying or installing any hardware or software in the appliance that is not part of the normal operation of the Cisco IPS.

## Connecting an Appliance to a Terminal Server

A terminal server is a router with multiple, low speed, asynchronous ports that are connected to other serial devices. You can use terminal servers to remotely manage network equipment, including appliances.

To set up a Cisco terminal server with RJ-45 or hydra cable assembly connections, follow these steps:

**Step 1** Connect to a terminal server using one of the following methods:

- For terminal servers with RJ-45 connections, connect a rollover cable from the console port on the appliance to a port on the terminal server.
- For hydra cable assemblies, connect a straight-through patch cable from the console port on the appliance to a port on the terminal server.

**Step 2** Configure the line and port on the terminal server. In enable mode, enter the following configuration, where # is the line number of the port to be configured.

```
config t
line #
login
transport input all
stopbits 1
flowcontrol hardware
speed 9600
exit
exit
wr mem
```

**Step 3** Be sure to properly close a terminal session to avoid unauthorized access to the appliance. If a terminal session is not stopped properly, that is, if it does not receive an exit(0) signal from the application that initiated the session, the terminal session can remain open. When terminal sessions are not stopped properly, authentication is not performed on the next session that is opened on the serial port.

**Caution** Always exit your session and return to a login prompt before terminating the application used to establish the connection.

**Caution** If a connection is dropped or terminated by accident, you should reestablish the connection and exit normally to prevent unauthorized access to the appliance.

# Time Sources and the Sensor

This section explains the importance of having a reliable time source for the sensors and how to correct the time if there is an error. It contains the following topics:


- The Sensor and Time Sources, page 1-23
- Synchronizing IPS Module System Clocks with the Parent Device System Clock, page 1-23
- Verifying the Sensor is Synchronized with the NTP Server, page 1-23

- Correcting the Time on the Sensor, page 1-24

# The Sensor and Time Sources

**Note** We recommend that you use an NTP server to regulate time on your sensor. You can use authenticated or unauthenticated NTP. For authenticated NTP, you must obtain the NTP server IP address, NTP server key ID, and the key value from the NTP server. You can set up NTP during initialization or you can configure NTP through the CLI, IDM, IME, or ASDM.

The sensor requires a reliable time source. All events (alerts) must have the correct UTC and local time stamp, otherwise, you cannot correctly analyze the logs after an attack. When you initialize the sensor, you set up the time zones and summertime settings. This section provides a summary of the various ways to set the time on sensors.

### The IPS Standalone Appliances

- Use the **clock set** command to set the time. This is the default.
- Configure the appliance to get its time from an NTP time synchronization source.

**Note** The currently supported Cisco IPS appliances are the IPS 4240, IPS 4255, and IPS 4260 [IPS 7.0(x) and later and IPS 7.1(5) and later], IPS 4270-20 [IPS 7.1(3) and later], IPS 4345 and IPS 4360 [IPS 7.1(3) and later], and IPS 4510 and IPS 4520 [IPS 7.1(4) and later].

### The ASA IPS Modules

- The ASA 5500-X IPS SSP and ASA 5585-X IPS SSP automatically synchronize their clocks with the clock in the adaptive security appliance in which they are installed. This is the default.
- Configure them to get their time from an NTP time synchronization source, such as a Cisco router other than the parent router.

# Synchronizing IPS Module System Clocks with the Parent Device System Clock

The ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) synchronize their clocks to the parent chassis clock (switch, router, or adaptive security appliance) each time the IPS boots up and any time the parent chassis clock is set. The IPS clock and parent chassis clock tend to drift apart over time. The difference can be as much as several seconds per day. To avoid this problem, make sure that both the IPS clock and the parent clock are synchronized to an external NTP server. If only the IPS clock or only the parent chassis clock is synchronized to an NTP server, the time drift occurs.

# Verifying the Sensor is Synchronized with the NTP Server

In the Cisco IPS, you cannot apply an incorrect NTP configuration, such as an invalid NTP key value or ID, to the sensor. If you try to apply an incorrect configuration, you receive an error message. To verify the NTP configuration, use the **show statistics host** command to gather sensor statistics. The NTP statistics section provides NTP statistics including feedback on sensor synchronization with the NTP server.

To verify the NTP configuration, follow these steps:

**Step 1** Log in to the sensor.

**Step 2** Generate the host statistics.

```
sensor# show statistics host
     ...
     NTP Statistics
            remote           refid      st t when poll reach   delay   offset  jitter
        11.22.33.44     CHU_AUDIO(1)     8 u   36   64    1    0.536    0.069   0.001
        LOCAL(0)        73.78.73.84      5 l   35   64    1    0.000    0.000   0.001
       ind assID status  conf reach auth condition  last_event cnt
         1 10372  f014   yes   yes   ok     reject   reachable  1
         2 10373  9014   yes   yes  none    reject   reachable  1
       status = Not Synchronized
     ...
```

**Step 3** Generate the hosts statistics again after a few minutes.

```
sensor# show statistics host
     ...
     NTP Statistics
            remote           refid      st t when poll reach   delay   offset  jitter
       *11.22.33.44     CHU_AUDIO(1)     8 u   22   64  377    0.518   37.975  33.465
        LOCAL(0)        73.78.73.84      5 l   22   64  377    0.000    0.000   0.001
       ind assID status  conf reach auth condition  last_event cnt
         1 10372  f624   yes   yes   ok   sys.peer   reachable  2
         2 10373  9024   yes   yes  none    reject   reachable  2
       status = Synchronized
```

**Step 4** If the status continues to read `Not Synchronized`, check with the NTP server administrator to make sure the NTP server is configured correctly.

# Correcting the Time on the Sensor

If you set the time incorrectly, your stored events will have the incorrect time because they are stamped with the time the event was created. The Event Store time stamp is always based on UTC time. If during the original sensor setup, you set the time incorrectly by specifying 8:00 p.m. rather than 8:00 a.m., when you do correct the error, the corrected time will be set backwards. New events might have times older than old events.

For example, if during the initial setup, you configure the sensor as central time with daylight saving time enabled and the local time is 8:04 p.m., the time is displayed as 20:04:37 CDT and has an offset from UTC of -5 hours (01:04:37 UTC, the next day). A week later at 9:00 a.m., you discover the error: the clock shows 21:00:23 CDT. You then change the time to 9:00 a.m. and now the clock shows 09:01:33 CDT. Because the offset from UTC has not changed, it requires that the UTC time now be 14:01:33 UTC, which creates the time stamp problem.

To ensure the integrity of the time stamp on the event records, you must clear the event archive of the older events by using the **clear events** command.

**Note** You cannot remove individual events.

### For More Information

For the procedure for clearing events, refer to Clearing Events from Event Store.

# Preparing the Appliance for Installation

This chapter describes the steps to follow before installing new hardware or performing hardware upgrades, and includes the following sections:


- Installation Preparation, page 2-1
- Safety Recommendations, page 2-2
- General Site Requirements, page 2-5


## Installation Preparation

To prepare for installing an appliance, follow these steps:

**Step 1** Review the safety precautions outlined in one of the following safety documents:

- *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4200 Series Appliance Sensor*
- *Regulatory Compliance and Safety Information for the Cisco ASA 5500-X Series Adaptive Security Appliances and the Intrusion Prevention System 4300 Series Appliances*
- *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4500 Series Sensor Appliance*

**Step 2** To familiarize yourself with the IPS and related documentation and where to find it on Cisco.com, read the *Documentation Roadmap for Cisco Intrusion Prevention System 7.1*.

**Step 3** Before proceeding with appliance installation, read the Release Notes for your software version, found at this URL:

http://www.cisco.com/en/US/products/hw/vpndevc/ps4077/prod_release_notes_list.html

**Step 4** Unpack the appliance. An accessory kit ships with the appliance. Refer to the chapter for your appliance for the accessory kit contents.

**Step 5** Place the appliance in an ESD-controlled environment.

**Step 6** Place the appliance on a stable work surface.

**Step 7** For installation instructions, see the chapter on your sensor in this book, *Cisco Intrusion Prevention System Appliance and Module Installation Guide for IPS 7.1*.

**For More Information**

- For ESD guidelines, see Electricity Safety Guidelines, page 2-2.
- For the procedure for working in an ESD environment, see Working in an ESD Environment, page 2-4.

# Safety Recommendations

This section lists the safety precautions you should take when working with IPS appliances, and contains the following topics:


- Safety Guidelines, page 2-2
- Electricity Safety Guidelines, page 2-2
- Preventing Electrostatic Discharge Damage, page 2-3
- Working in an ESD Environment, page 2-4


## Safety Guidelines

Use the following guidelines to help ensure your safety and protect the appliance. The list of guidelines may not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

**Note** Removing the chassis cover to install a hardware component does not affect your Cisco warranty. Upgrading the appliance does not require any special tools and does not create any radio frequency leaks.

The safety guidelines are as follows:

- Keep the chassis area clear and dust-free before, during and after installation.
- Keep tools away from walk areas where you and others could fall over them.
- Do not wear loose clothing or jewelry, such as earrings, bracelets, or chains, that could get caught in the chassis.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person to handle.

## Electricity Safety Guidelines

**Warning** **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.** Statement 12

Follow these guidelines when working on equipment powered by electricity:

- Before beginning procedures that require access to the interior of the chassis, locate the emergency power-off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn off the power.
- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected from a circuit; always check the circuit.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Disconnect power from the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.
- Use the chassis within its marked electrical ratings and product usage instructions.
- Install the appliance in compliance with local and national electrical codes as listed in one of the following safety documents:
  - *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4200 Series Appliance Sensor*
  - *Regulatory Compliance and Safety Information for the Cisco ASA 5500-X Series Adaptive Security Appliances and the Intrusion Prevention System 4300 Series Appliances*
  - *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4500 Series Sensor Appliance*
- The sensor models equipped with AC-input power supplies are shipped with a 3-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. This is a safety feature that you should not circumvent. Equipment grounding should comply with local and national electrical codes.

# Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled, which can result in complete or intermittent failures.

- Always follow ESD-prevention procedures when you remove and replace components. Make sure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, and make sure that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground unwanted ESD voltage. To guard against ESD damage and shocks, the wrist strap and cord must operate properly. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- For safety, periodically check the resistance value of the anti-static strap, which should be between 1 and 10 megohms (Mohms).

# Working in an ESD Environment

Work on ESD-sensitive parts only at an approved static-safe station on a grounded static dissipative work surface, for example, an ESD workbench or static dissipative mat.

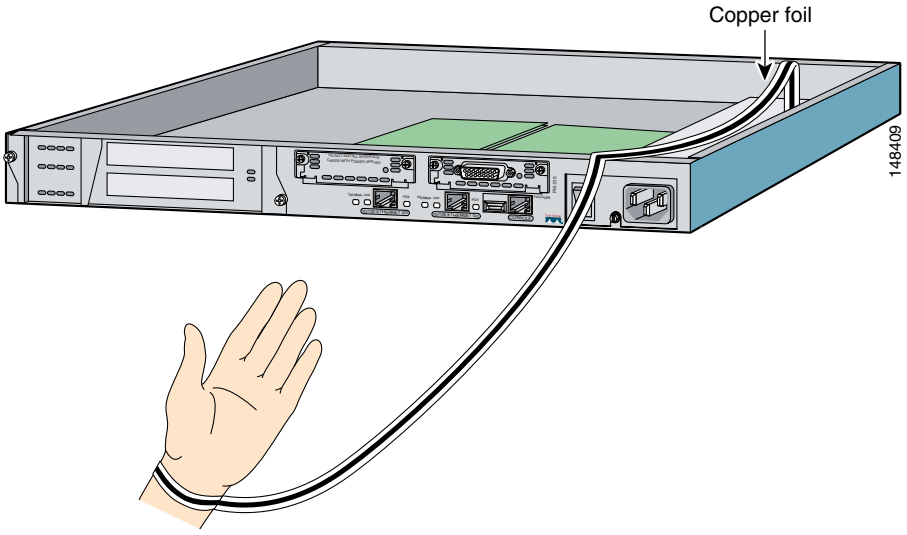
To remove and replace components in a sensor, follow these steps:

**Step 1** Remove all static-generating items from your work area.

**Step 2** Use a static dissipative work surface and wrist strap.

**Note** Disposable wrist straps, typically those included with an upgrade part, are designed for one time use.

**Step 3** Attach the wrist strap to your wrist and to the terminal on the work surface. If you are using a disposable wrist strap, connect the wrist strap directly to an unpainted metal surface of the chassis.




**Step 4** Connect the work surface to the chassis using a grounding cable and alligator clip.

**Caution** Always follow ESD-prevention procedures when removing, replacing, or repairing components.

**Note** If you are upgrading a component, do not remove the component from the ESD packaging until you are ready to install it.

# General Site Requirements

This section describes the requirements your site must meet for safe installation and operation of your IPS appliance. This section includes the following topics:


- Site Environment, page 2-5
- Preventive Site Configuration, page 2-5
- Power Supply Considerations, page 2-6
- Configuring Equipment Racks, page 2-6


## Site Environment

Place the appliance on a desktop or mount it in a rack. The location of the appliance and the layout of the equipment rack or wiring room are extremely important for proper system operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause system malfunctions and shutdowns, and can make appliance maintenance difficult.

When planning the site layout and equipment locations, keep in mind the following precautions to help avoid equipment failures and reduce the possibility of environmentally-caused shutdowns. If you are experiencing shutdowns or unusually high errors with your existing equipment, these precautions may help you isolate the cause of failures and prevent future problems.

- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Make sure that the room in which you operate your system has adequate air circulation.
- Always follow the ESD-prevention procedures to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Make sure that the chassis top panel is secure. The chassis is designed to allow cooling air to flow effectively within it. An open chassis allows air leaks, which can interrupt and redirect the flow of cooling air from the internal components.

## Preventive Site Configuration

The following precautions will help plan an acceptable operating environment for the chassis and avoid environmentally caused equipment failures:

- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Ensure that the room in which you operate your system has adequate air circulation.
- Always follow the ESD-prevention procedures described previously to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis top panel is secure. The chassis is designed to allow cooling air to flow effectively within it. An open chassis allows air leaks, which may interrupt and redirect the flow of cooling air from the internal components.

# Power Supply Considerations

The IPS 4270-20 has an AC power supply. The IPS 4345, IPS 4360, IPS 4510, and IPS 4520 have either an AC or DC power supply.

Follow these guidelines for power supplies:

- Check the power at the site before installing the chassis to ensure that the power is free of spikes and noise. Install a power conditioner if necessary, to ensure proper voltages and power levels in the source voltage.
- Install proper grounding for the site to avoid damage from lightning and power surges.
- The following applies to a chassis equipped with an AC-input power supply:
  - The chassis does not have a user-selectable operating range. Refer to the label on the chassis for the correct AC-input power requirement.
  - Several types of AC-input power supply cords are available; make sure you have the correct type for your site.
  - Install a UPS for your site.
  - Install proper site-grounding facilities to guard against damage from lightning or power surges.

# Configuring Equipment Racks

The following tips help you plan an acceptable equipment rack configuration:

- Enclosed racks must have adequate ventilation. Ensure that the rack is not overly congested, because each chassis generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated all the way into the rack.
- In an enclosed rack with a ventilation fan in the top, excessive heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. Ensure that you provide adequate ventilation for equipment at the bottom of the rack.
- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack. Experiment with different arrangements to position the baffles effectively.

# Installing the IPS 4270-20

## Contents

This chapter describes the IPS 4270-20, and includes the following sections:


- Installation Notes and Caveats, page 3-1
- Product Overview, page 3-2
- Supported Interface Cards, page 3-4
- Hardware Bypass, page 3-5
- Front and Back Panel Features, page 3-8
- Diagnostic Panel, page 3-14
- Specifications, page 3-15
- Accessories, page 3-16
- Installing the Rail System Kit, page 3-16
- Installing the IPS 4270-20, page 3-35
- Removing and Replacing the Chassis Cover, page 3-39
- Accessing the Diagnostic Panel, page 3-42
- Installing and Removing Interface Cards, page 3-43
- Installing and Removing the Power Supply, page 3-45
- Installing and Removing Fans, page 3-50
- Troubleshooting Loose Connections, page 3-52


## Installation Notes and Caveats

Pay attention to the following installation notes and caveats before installing the IPS 4270-20.

**Caution** The BIOS on the IPS 4270-20 is specific to the IPS 4270-20 and must only be upgraded under instructions from Cisco with BIOS files obtained from the Cisco website. Installing a non-Cisco or third-party BIOS on the IPS 4270-20 voids the warranty. For more information on how to obtain instructions and BIOS files from the Cisco website, see Obtaining Cisco IPS Software, page C-1.

**Warning** **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than 120 VAC, 20 A U.S. (240 VAC, 16-20 A International).** Statement 1005

**Warning** **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

**Warning** **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

**Warning** **This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.** Statement 1028

**Note** Removing the appliance chassis cover does not affect your Cisco warranty. Upgrading the IPS 4270-20 does not require any special tools and does not create any radio frequency leaks.

**Note** In IPS 7.1, rx/tx flow control is disabled on the IPS 4270-20. This is a change from IPS 7.0 where rx/tx flow control is enabled by default.

**Caution** Do not operate the IPS 4270-20 for long periods with the chassis cover open or removed. Operating it in this manner results in improper airflow and improper cooling that can lead to thermal damage.

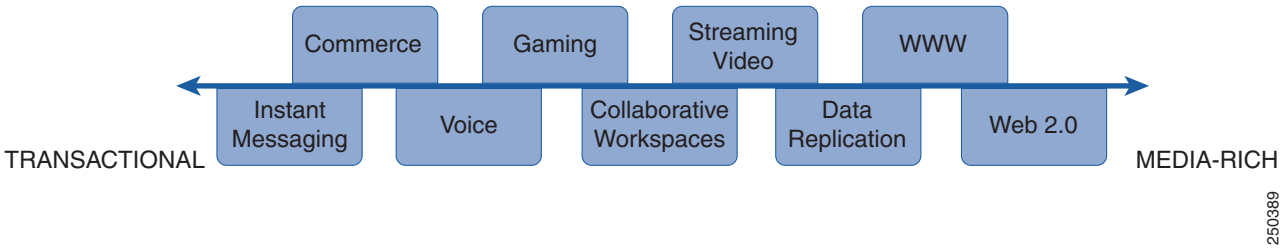
**Note** On IPS sensors with multiple processors (for example, the IPS 4260 and IPS 4270-20), packets may be captured out of order in the IP logs and by the **packet** command. Because the packets are not processed using a single processor, the packets can become out of sync when received from multiple processors.

# Product Overview

The IPS 4270-20 delivers up to 4 Gbps of performance in media-rich environments and 2 Gbps in transactional environments enabling you to protect fully saturated Gigabit networks and aggregate network traffic on multiple sensing interfaces. The IPS 4270-20 is also inline ready and has support for both copper and fiber NICs thus providing flexibility of deployment in any environment.

Media-rich environments are characterized by content, such as that seen on popular websites with video and file transfer. Transactional environments are characterized by connections, such as E-commerce, instant messaging, and voice. Figure 3-1 demonstrates the spectrum of media-rich and transactional environments.

***Figure 3-1 Media-rich and Transactional Environments***




The IPS 4270-20 has two built-in GigabitEthernet network ports and nine expansion slots. The network port numbers are numbered from top to bottom beginning with 0 and the expansion slot numbers increase from right to left. The two built-in GigabitEthernet ports are used for management and are called Management0/0 and Management0/1. Management0/1 is reserved for future use. Slots 1 and 2 are reserved for future use. You can populate slots 3 through 8 with supported network interface cards. Slot 9 is populated by a RAID controller card and is not available for use by network interface cards. The sensing interfaces are called GigabitEthernet.

Because of the multiple interfaces on the IPS 4270-20, it can cover multiple subnets, each of which have bandwidth requirements in the multi-T3 range or Gigabit range, and the multiple interfaces can be connected directly to the additional monitoring interfaces without needing to SPAN the traffic through a switch.

For improved reliability, the IPS 4270-20 uses a compact flash device for storage rather than a hard-disk drive. The IPS 4270-20 supports two optional network interface cards, the 2SX interface card with fiber-optic ports, and the 4GE bypass interface card with copper ports that contains the hardware-bypass feature. Initially the IPS 4270-20 supports only the built-in interfaces and these two interface cards.

The IPS 4270-20 supports a maximum of 16 sensing ports. Any additional configured ports will not be monitored and will not appear in the IPS configuration or statistics and no inline traffic will be forwarded on or between these ports. You receive the following error if you exceed the number of supported ports:

```
The number of installed network interfaces exceeds the limit of 16. The excess interfaces
are ignored.
```

**Note** If you add a new interface card that exceeds the limit, one or more of the previous sensing interfaces may become disabled.

The IPS 4270-20 ships with two power supplies, thus supporting a redundant power supply configuration. The IPS 4270-20 operates in load-sharing mode when the redundant power supply is installed.

### For More Information

- For more information on sensor interfaces, see Sensor Interfaces, page 1-4.
- For more information on the supported interface cards, see Supported Interface Cards, page 3-4.

- For more information on the 4GE bypass interface card, see Hardware Bypass, page 3-5.
- For more information about the power supplies, see Installing and Removing the Power Supply, page 3-45.

# Supported Interface Cards

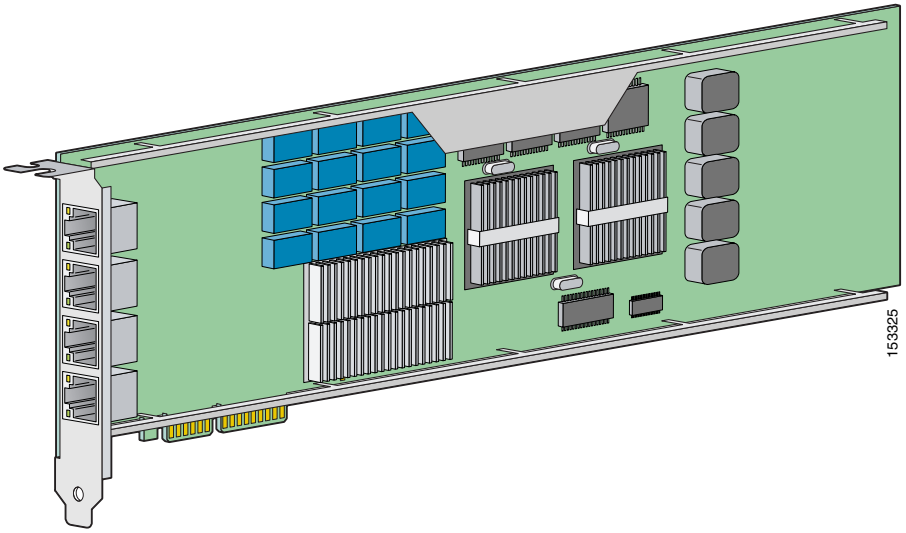
The IPS 4270-20 supports three interface cards: the 4GE bypass interface card, the 2SX interface card, and the 10GE interface card.

### 4GE Bypass Interface Card

The 4GE bypass interface card (part numbers IPS-4GE-BP-INT and IPS-4GE-BP-INT=) provides four 10/100/1000BASE-T (4GE) monitoring interfaces. The IPS 4270-20 supports up to four 4GE bypass interface cards for a total of sixteen GE bypass interfaces. The 4GE bypass interface card supports hardware bypass.

Figure 3-2 shows the 4GE bypass interface card.

*Figure 3-2 4GE Bypass Interface Card*



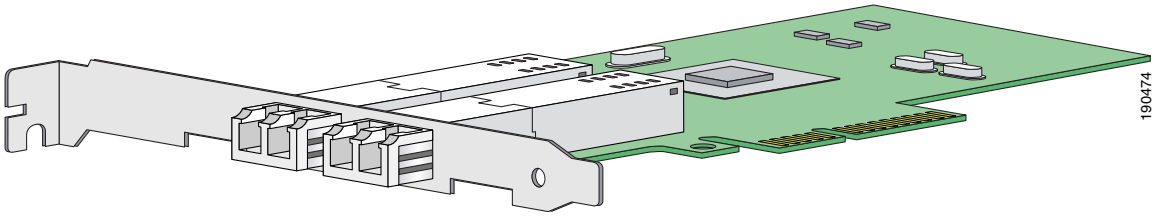

### 2SX Interface Card

The 2SX interface card (part numbers IPS-2SX-INT and IPS-2SX-INT=) provides two 1000BASE-SX (fiber) monitoring interfaces. The IPS 4270-20 supports up to six 2SX interface cards for a total of twelve SX interfaces.

The 2SX card ports require a multi-mode fiber cable with an LC connector to connect to the SX interface of the sensor. The 2SX interface card does not support hardware bypass.

Figure 3-3 shows the 2SX interface card.

*Figure 3-3 2SX Interface Card*



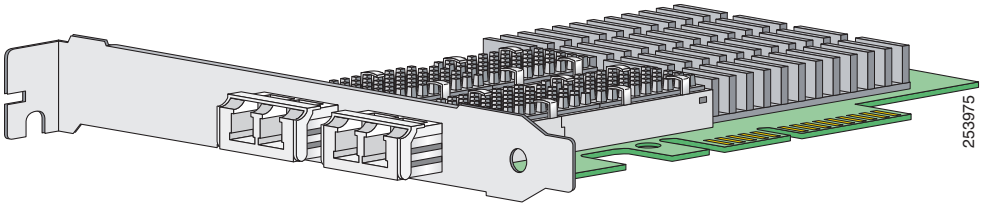

### 10GE Interface Card

The 10GE interface card (part numbers IPS-2X10GE-SR-INT and IPS-2X10GE-SR-INT=) provides two 10000 Base-SX (fiber) interfaces. The IPS 4270-20 supports up to two 10GE interface cards for a total of four 10GE fiber interfaces.

The card ports require a multi-mode fiber cable with an LC connector to connect to the SX interface of the IPS 4270-20. The 10GE interface card does not support hardware bypass.

Figure 3-4 shows the 10GE interface card.

*Figure 3-4 10GE Interface Card*




GigabitEthernet *slot_number/port_number* is the expansion card interface naming convention for the IPS 4270-20. The slot number is shown above the slot in the chassis and the port number is numbered from top to bottom starting with 0.

# Hardware Bypass

This section describes the 4GE bypass interface card and its configuration restrictions. For the procedure for installing and removing the 4GE bypass interface card, see Installing and Removing Interface Cards, page 3-43. This section contains the following topics:

- 4GE Bypass Interface Card, page 3-6
- Hardware Bypass Configuration Restrictions, page 3-6
- Hardware Bypass and Link Changes and Drops, page 3-7

# 4GE Bypass Interface Card

The IPS 4270-20 supports the 4-port GigabitEthernet card (part number IPS-4GE-BP-INT=) with hardware bypass. This 4GE bypass interface card supports hardware bypass only between ports 0 and 1 and between ports 2 and 3.

**Note** To disable hardware bypass, pair the interfaces in any other combination, for example 2/0<->2/2 and 2/1<->2/3.

Hardware bypass complements the existing software bypass feature in Cisco IPS. The following conditions apply to hardware bypass and software bypass:

- When bypass is set to OFF, software bypass is not active.

  For each inline interface for which hardware bypass is available, the component interfaces are set to disable the fail-open capability. If SensorApp fails, the sensor is powered off, reset, or if the NIC interface drivers fail or are unloaded, the paired interfaces enter the fail-closed state (no traffic flows through inline interface or inline VLAN subinterfaces).

- When bypass is set to ON, software bypass is active.

  Software bypass forwards packets between the paired physical interfaces in each inline interface and between the paired VLANs in each inline VLAN subinterface. For each inline interface on which hardware bypass is available, the component interfaces are set to standby mode. If the sensor is powered off, reset, or if the NIC interfaces fail or are unloaded, those paired interfaces enter fail-open state in hardware (traffic flows unimpeded through inline interface). Any other inline interfaces enter fail-closed state.

- When bypass is set to AUTO (traffic flows without inspection), software bypass is activated if SensorApp fails.

  For each inline interface on which hardware bypass is available, the component interfaces are set to standby mode. If the sensor is powered off, reset, or if the NIC interfaces fail or are unloaded, those paired interfaces enter fail-open state in hardware. Any other inline interfaces enter the fail-closed state.

  **Note** To test fail-over, set the bypass mode to ON or AUTO, create one or more inline interfaces and power down the sensor and verify that traffic still flows through the inline path.

# Hardware Bypass Configuration Restrictions

To use the hardware bypass feature on the 4GE bypass interface card, you must pair interfaces to support the hardware design of the card. If you create an inline interface that pairs a hardware-bypass-capable interface with an interface that violates one or more of the hardware-bypass configuration restrictions, hardware bypass is deactivated on the inline interface and you receive a warning message similar to the following:

```
Hardware bypass functionality is not available on Inline-interface pair0.
Physical-interface GigabitEthernet2/0 is capable of performing hardware bypass only when
paired with GigabitEthernet2/1, and both interfaces are enabled and configured with the
same speed and duplex settings.
```

The following configuration restrictions apply to hardware bypass:

- The 4-port bypass card is only supported on the IPS 4270-20.
- Fail-open hardware bypass only works on inline interfaces (interface pairs), not on inline VLAN pairs.
- Fail-open hardware bypass is available on an inline interface if all of the following conditions are met:
  - Both of the physical interfaces support hardware bypass.
  - Both of the physical interfaces are on the same interface card.
  - The two physical interfaces are associated in hardware as a bypass pair.
  - The speed and duplex settings are identical on the physical interfaces.
  - Both of the interfaces are administratively enabled.
- Autonegotiation must be set on MDI/X switch ports connected to the IPS 4270-20.

  You must configure both the sensor ports and the switch ports for autonegotiation for hardware bypass to work. The switch ports must support MDI/X, which automatically reverses the transmit and receive lines if necessary to correct any cabling problems. The sensor is only guaranteed to operate correctly with the switch if both of them are configured for identical speed and duplex, which means that the sensor must be set for autonegotiation too.

#### Hardware Bypass Turned Off for System Image Recovery or Reimage

Hardware bypass starts when you enter the **recover application** command and the interfaces are paired correctly. Hardware bypass works until the IPS starts up again with the empty configuration. Because all interfaces default to `disabled` and are no longer paired, when the SensorApp loads, it stops hardware bypass and sets the interfaces to `link down`. BEFORE you perform a reimage or recover, make sure you bypass the traffic at the switch.

## Hardware Bypass and Link Changes and Drops

Properly configuring and deploying hardware bypass protects against complete link failure if the IPS appliance experiences a power loss, critical hardware failure, or is rebooted; however, a link status change still occurs when hardware bypass engages (and again when it disengages).

During engagement, the interface card disconnects both physical connections from itself and bridges them together. The interfaces of the connected devices can then negotiate the link and traffic forwarding can resume. Once the appliance is back online, hardware bypass disengages and the interface card interrupts the bypass and reconnects the links back to itself. The interface card then negotiates both links and traffic resumes.

There is no built-in way to completely avoid link status changes and drops. However, you can greatly reduce the interruption time (in some cases to sub-second times) by doing the following:

- Make sure you use CAT 5e/6-certified cabling for all connections.
- Make sure the interfaces of the connected devices are configured to match the interfaces of the appliance for speed/duplex negotiation (auto/auto).
- Enable portfast on connected switchports to reduce spanning-tree forwarding delays.

# Front and Back Panel Features

This section describes the IPS 4270-20 front and back panel features, indicators, and internal components. Figure 3-5 shows the front view of the IPS 4270-20.

***Figure 3-5 IPS 4270-20 Front View***

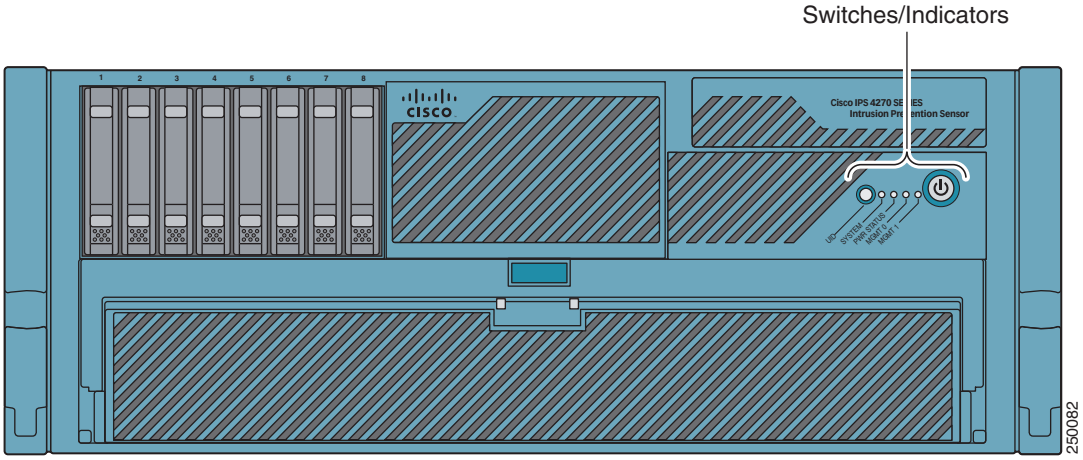



Figure 3-6 shows the front panel switches and indicators.

***Figure 3-6 IPS 4270-20 Front Panel Switches and Indicators***

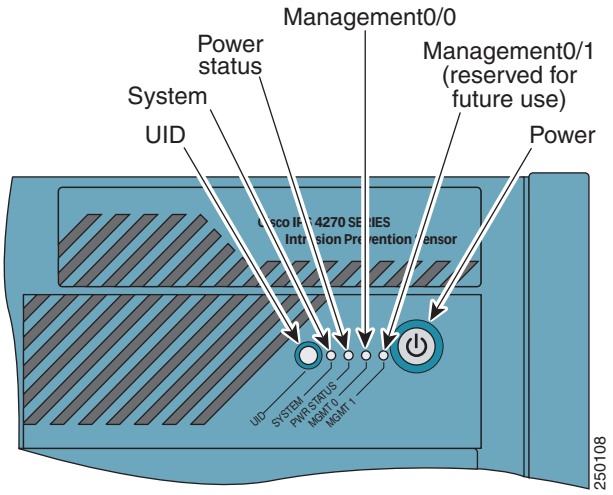


Table 3-1 describes the front panel switches and indicators on the IPS 4270-20.

*Table 3-1 Front Panel Switches and Indicators*

| Indicator | Description |
|---|---|
| UID switch and indicator | Toggles the system ID indicator, which assists with chassis location in a rack:<br>• Blue—Activated<br>• Off—Deactivated<br>**Note** The ID switch is activated by a switch on the front of the chassis. |
| Internal system health indicator | Indicates internal system health:<br>• Green—System on<br>• Flashing amber—System health degraded<br>• Flashing red—System health critical<br>• Off—System off |
| Power status indicator | Indicates the power supply status:<br>• Green—Power supply on<br>• Flashing amber—Power supply health degraded<br>• Flashing red—Power supply health critical<br>• Off—Power supply off |
| MGMT0/0 indicator | Indicates the status of the management port:<br>• Green—Linked to network<br>• Flashing green—Linked with activity on the network<br>• Off—No network connection |
| MGMT0/1 indicator | Reserved for future use |
| Power switch and indicator | Turns power on and off:<br>• Amber—System has AC power and is in standby mode<br>• Green—System has AC power and is turned on<br>• Off—System has no AC power |

Figure 3-7 shows the back view of the IPS 4270-20.

***Figure 3-7 IPS 4270-20 Back Panel Features***

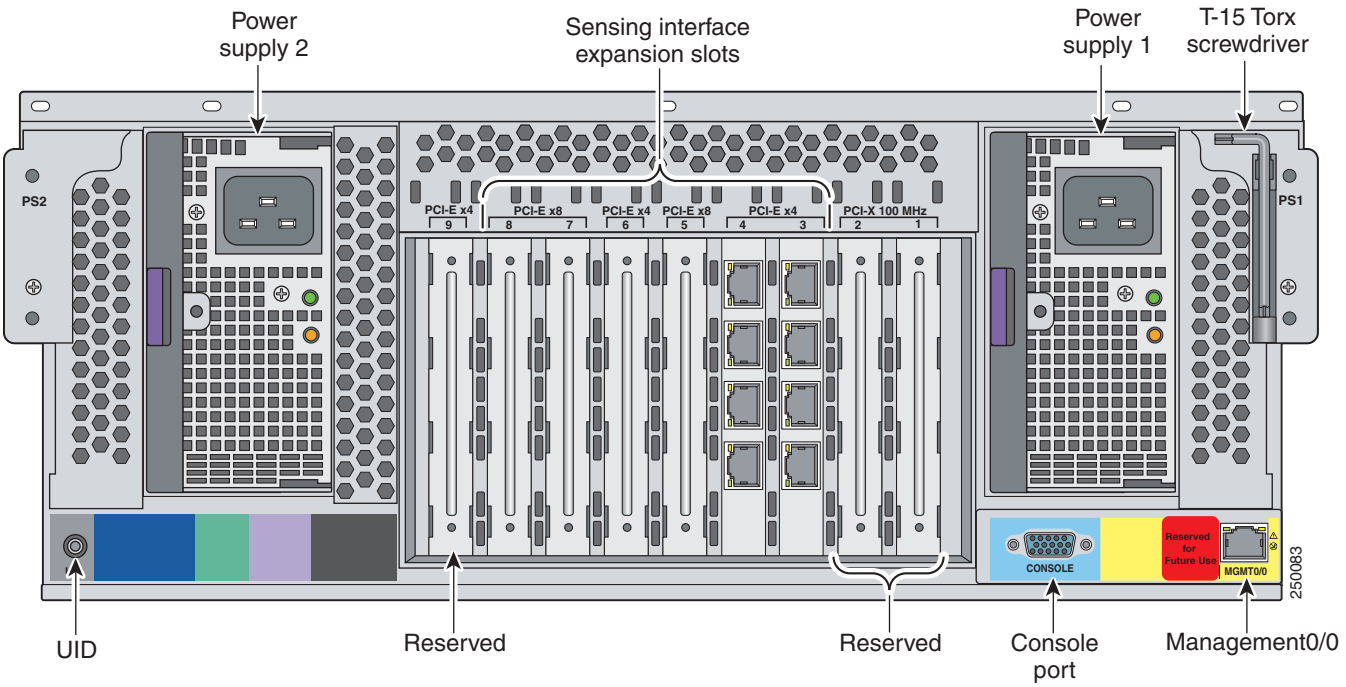


Figure 3-8 shows the built-in Ethernet port, which has two indicators per port, and the power supply indicators.

***Figure 3-8 Ethernet Port Indicators***

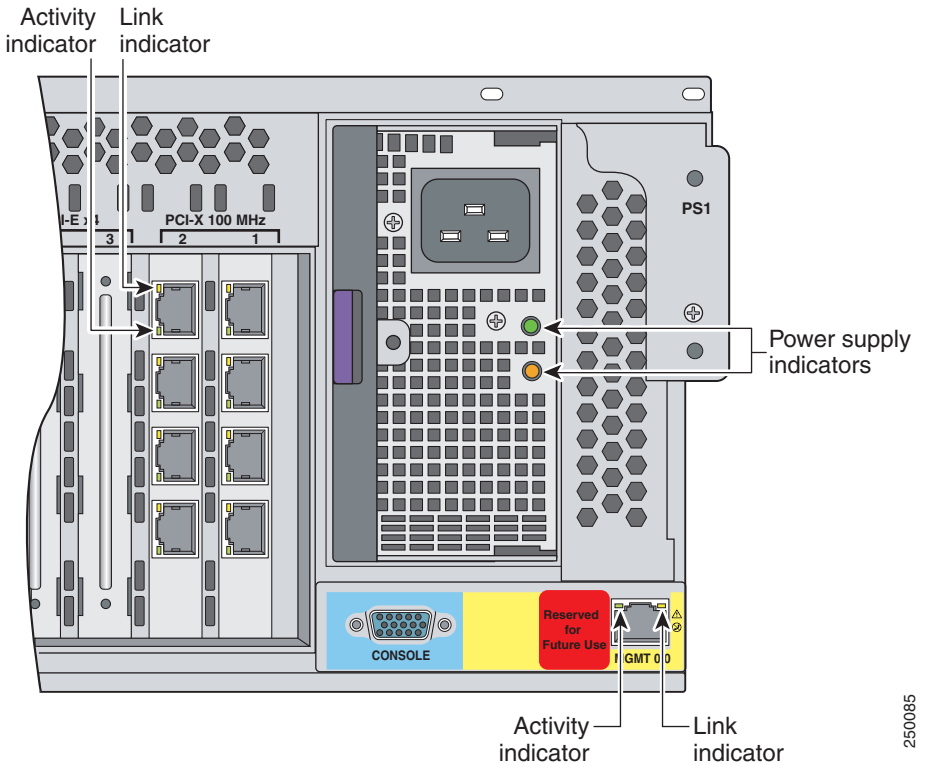



Table 3-2 describes the Ethernet port indicators.

***Table 3-2 Ethernet Port Indicators***

| Indicator | Indicator (Green) | Description |
|---|---|---|
| Activity | On or flashing<br>Off | Network activity<br>No network activity |
| Link | On<br>Off | Linked to network<br>Not linked to network |

Table 3-3 describes the power supply indicators.

***Table 3-3 Power Supply Indicators***

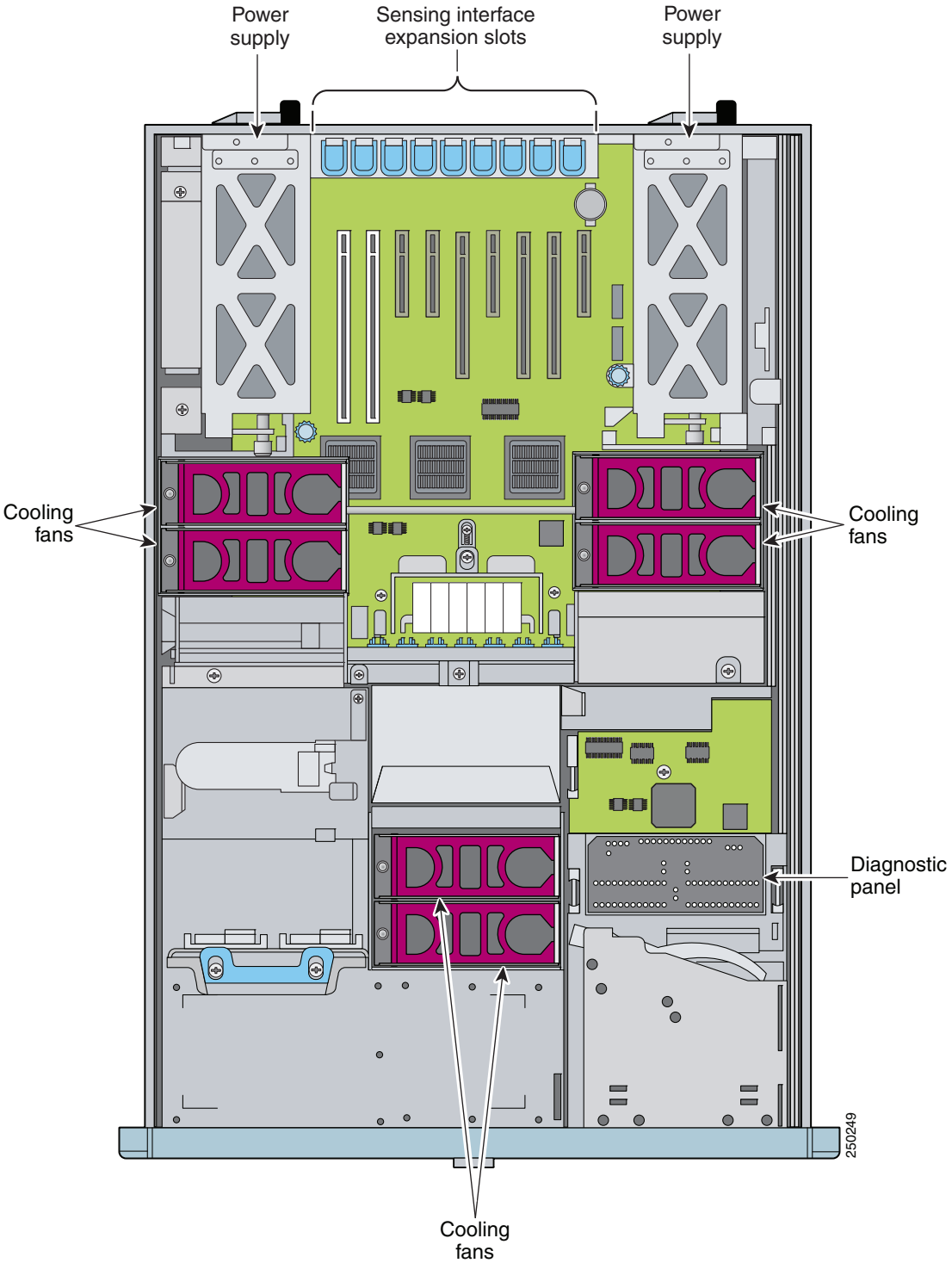
| Fail Indicator 1 Amber | Power Indicator 2 Green | Description |
|---|---|---|
| Off | Off | No AC power to any power supply |
| Flashing | Off | Power supply failure (over current) |
| On | Off | No AC power to this power supply |

*Table 3-3 Power Supply Indicators (continued)*

| Fail Indicator 1 Amber | Power Indicator 2 Green | Description |
|---|---|---|
| Off | Flashing | • AC power present<br>• Standby mode |
| Off | On | Normal |

Figure 3-9 shows the internal components.

***Figure 3-9 IPS 4270-20 Internal Components***



# Diagnostic Panel

The front panel health indicators only indicate the current hardware status. The Diagnostic Panel indicators identify components experiencing an error, event, or failure. All indicators are off unless one of the component fails.

**Note** When you remove the chassis cover to view the Diagnostic Panel, leave the IPS 4270-20 powered on. Powering off the IPS 4270-20 clears the Diagnostic Panel indicators.

Figure 3-10 shows the Diagnostic Panel.

***Figure 3-10 Diagnostic Panel***

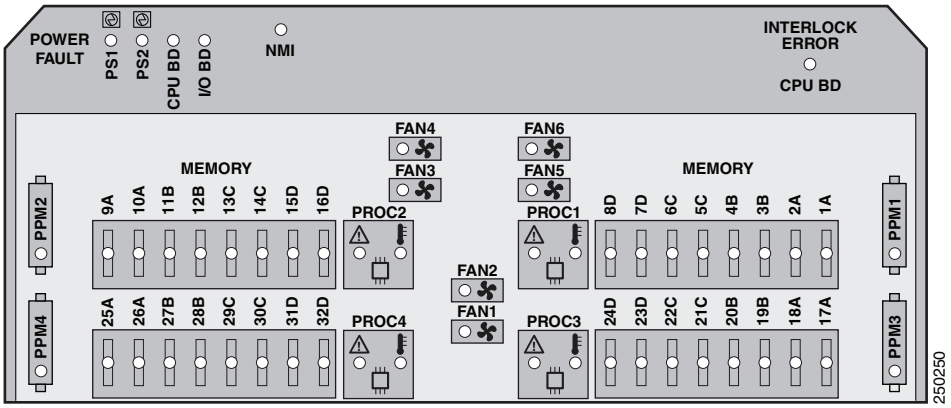



Table 3-4 lists the indicators that display health status for each component:

***Table 3-4 Diagnostic Panel Indicators***

| Indicator | Component |
|---|---|
| PS1 | Power supply (primary) |
| PS2 | Power supply (optional) |
| CPU BD (power fault) | Processor memory module board |
| I/O BD | System board |
| NMI | System NMI switch |
| Slot X | Expansion slot |
| CPU BD (interlock error) | System board |
| PPM X | Processor power module |
| 1A-32D | DIMM Slot |
| PROC X | Processor |
| FAN X | Fan |

### For More Information

- For the location of the Diagnostic Panel in the IPS 4270-20 chassis, see Figure 3-9 on page 3-13.
- For information on how to access the Diagnostic Panel, see Accessing the Diagnostic Panel, page 3-42.

# Specifications

Table 3-5 lists the specifications for the IPS 4270-20.

*Table 3-5 IPS 4270-20 Specifications*

| | |
|---|---|
| **Dimensions and Weight** | |
| Height | 6.94 in. (17.6 cm) |
| Width | 19.0 in. (46.3 cm) |
| Depth | 26.5 in. (67.3 cm) |
| Weight | 80 lb (36.3 kg) |
| Form factor | 4 RU, standard 19-inch rack-mountable |
| **Power** | |
| Rated input voltage | 100 to 127 VAC<br>200 to 240 VAC |
| Rated input frequency | 50 to 60 Hz |
| Rated input power | 1161W @ 100 VAC<br>1598W @ 200 VAC |
| Rated input current | 12A (100 VAC)<br>8A (200 VAC) |
| Maximum heat dissipation | 3960 BTU/hr (100 VAC)<br>5450 BTU/hr (200 VAC) |
| Power supply output | 910 W (low line)<br>1300 W (high line) |
| **Environment** | |
| Temperature | Operating 50 to 95°F (10 to 35°C)[1]<br>Nonoperating -40°F to 158°F (-40°C to 70°C) |
| Maximum wet bulb temperature | 82.4°F (28°C) |
| Relative humidity (noncondensing) | Operating 10% to 90%<br>Nonoperating 5% to 95% |
| Altitude | Operating 0 to 10,000 ft (3050 m)<br>Nonoperating 0 to 30,000 ft (9144 m) |
| Shock | Operating Half-sine 2 G, 11 ms pulse, 100 pulses<br>Nonoperating 25 G, 170 inches/sec delta V |
| Vibration | 2.2 Grms, 10 minutes per axis on all three axes |

1. At sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 3.0m) above sea level to a maximum of 10,000 ft (3050 m). no direct sustained sunlight.

# Accessories

The IPS 4270-20 accessories kit contains the following:

- DB-9 connector
- DB-9/RJ-45 console cable
- Two Ethernet RJ-45 cables
- *Regulatory Compliance and Safety Information for the Cisco Intrusion Detection and Prevention System 4200 Series Appliance Sensor*
- *Documentation Roadmap for Cisco Intrusion Prevention System*

# Installing the Rail System Kit

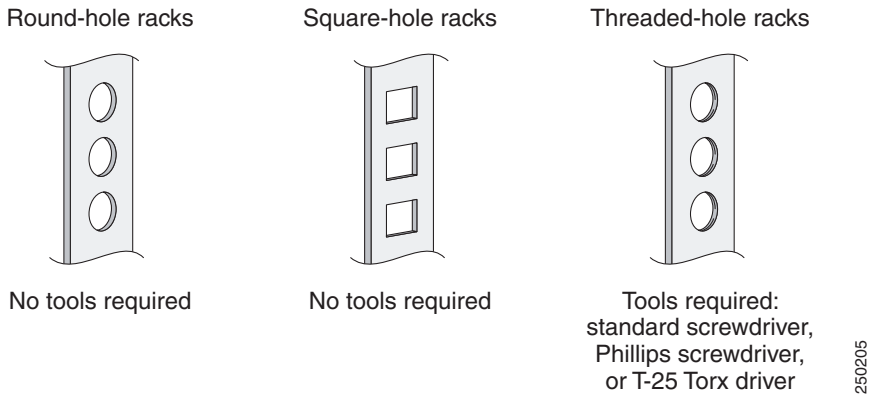
You can install the IPS 4270-20 in a 4-post rack. This section describes how to install the IPS 4270-20 in a rack, and contains the following sections:

- Understanding the Rail System Kit, page 3-16
- Rail System Kit Contents, page 3-17
- Space and Airflow Requirements, page 3-17
- Installing the IPS 4270-20 in the Rack, page 3-18
- Extending the IPS 4270-20 from the Rack, page 3-26
- Installing the Cable Management Arm, page 3-28
- Converting the Cable Management Arm, page 3-32

## Understanding the Rail System Kit

This rail system supports a variety of products that can be installed in round-, square, or threaded-hole racks. The following illustration shows the three rack hole-types. Use Figure 3-11 to identify your rack type and then follow the installation steps accordingly.

***Figure 3-11 Round-, Square-, and Threaded-Hole Racks***



No tools are required for the round- and square-hole racks. You may need screws that fit the threaded-hole rack and a driver for those screws.You need a standard screwdriver to remove the round- and square-hole studs from the slide assemblies when you install the security appliance in a threaded-whole rack.

This rail system supports a minimum rack depth of 24 in. (60.96 cm) and a maximum rack depth of 36.5 in. (92.71 cm).

# Rail System Kit Contents

The rail system kit contains the following items:

- Two slide assemblies
- Two chassis rails
- Four Velcro straps
- Six zip ties
- One cable management arm
- A package of miscellaneous parts (screws, and so forth)
- One cable management arm stop bracket

# Space and Airflow Requirements

To allow for servicing and adequate airflow, follow these space and airflow requirements when choosing where to place a rack:

- Leave a minimum clearance of 25 in. (63.5 cm) in front of the rack.
- Leave a minimum clearance of 30 in. (76.2 cm) behind the rack.
- Leave a minimum clearance of 48 in. (121.9 cm) from the back of the rack to the back of another rack or row of racks.

IPS 4270-20 draws in cool air through the front and expels warm air through the back. The front and back rack doors must be adequately ventilated to allow ambient room air to enter the chassis and the back must be adequately ventilated to allow warm air to escape from the chassis.

# Installing the IPS 4270-20 in the Rack

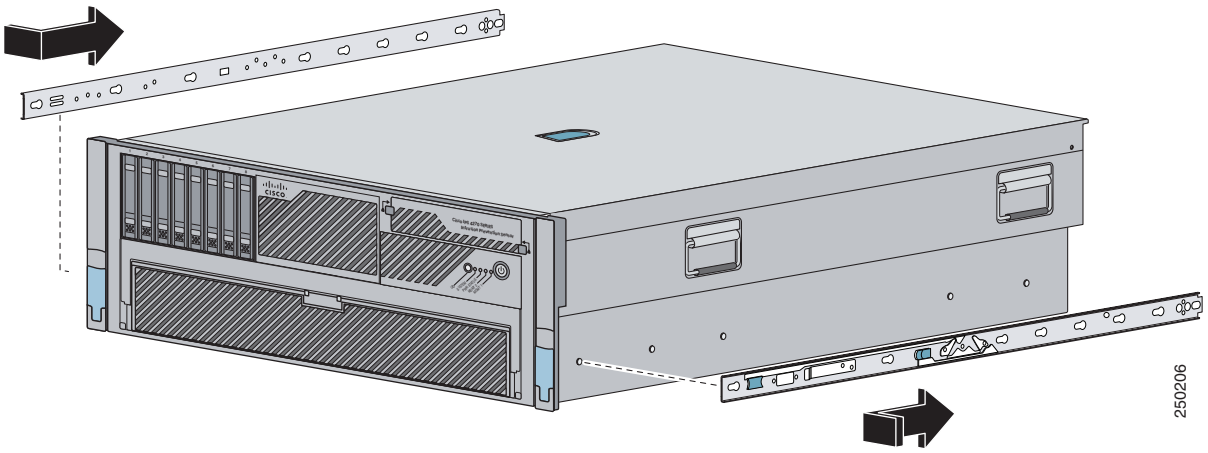
**Warning** **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

**Warning** **This procedure requires two or more people to position the IPS 4270-20 on the slide assemblies before pushing it in to the rack.**

To install the IPS 4270-20 in the rack, follow these steps:

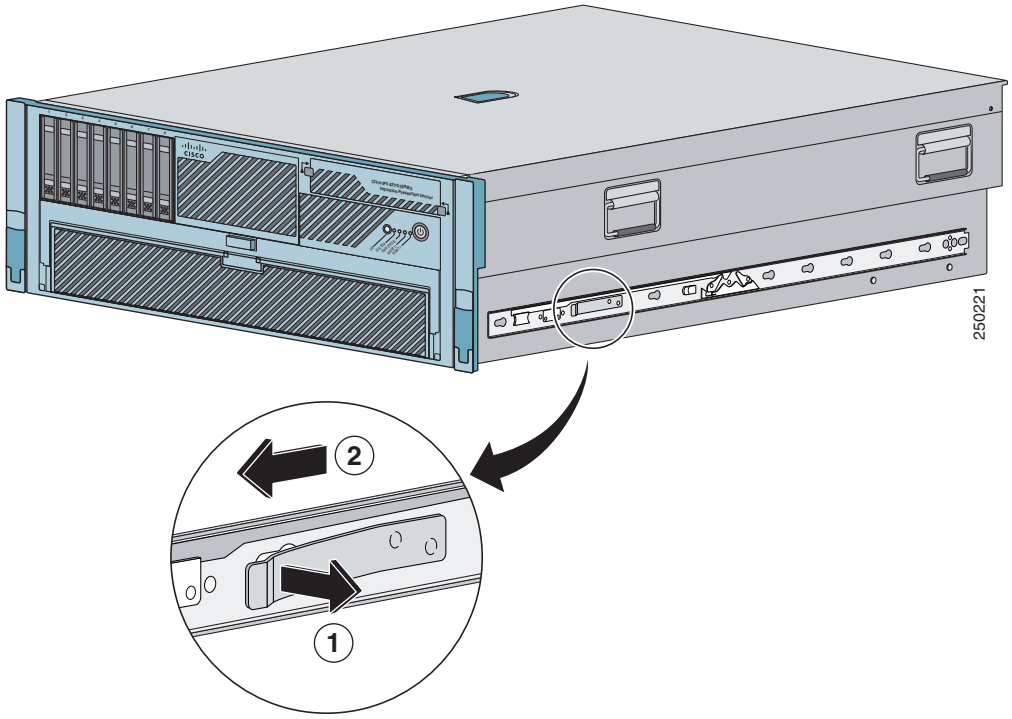
**Step 1** Attach the chassis side rail to the IPS 4270-20 by aligning the chassis rail to the stud on the IPS 4270-20, pressing the chassis side rail in to the stud, and then sliding the chassis side rail backwards until you hear the latch catch.



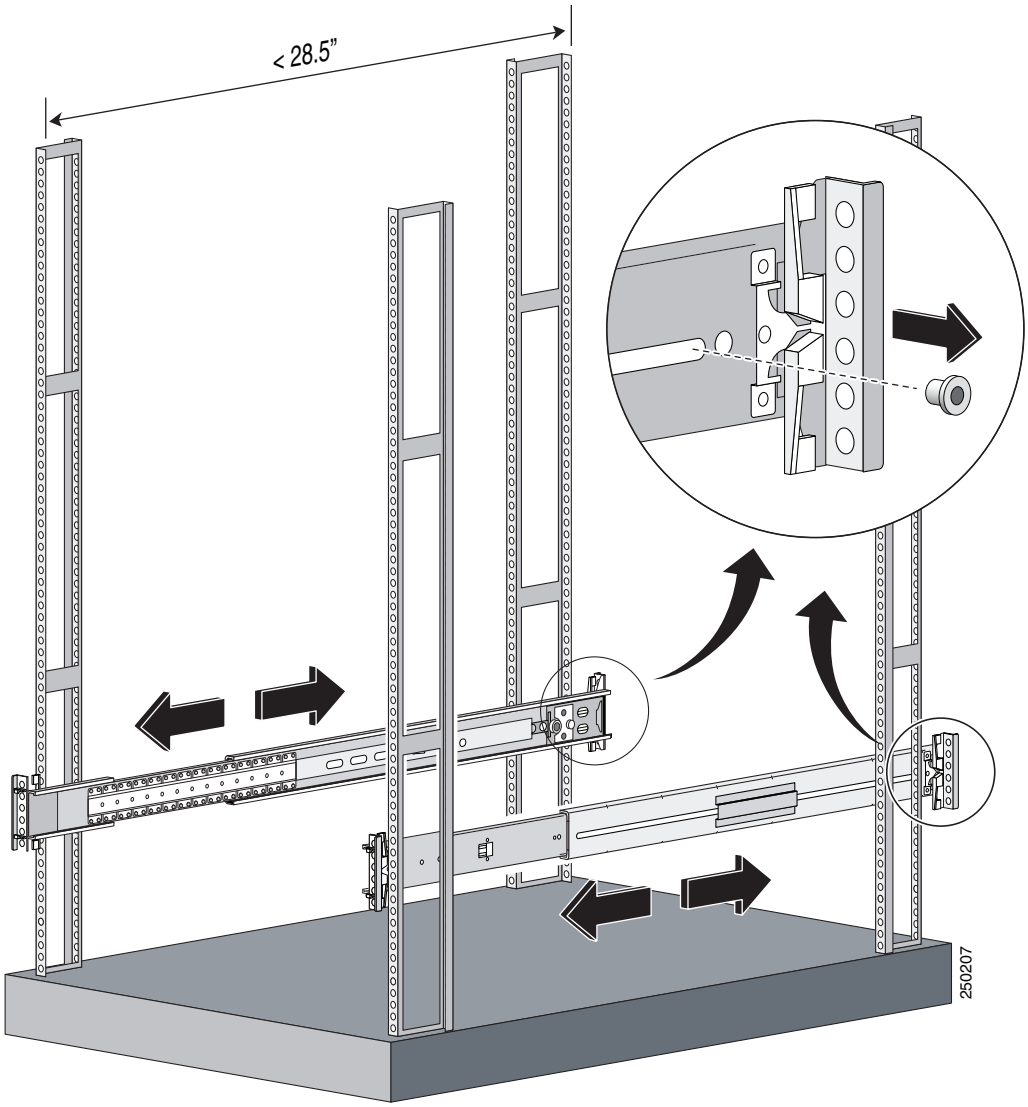

**Note** The tapered end of the chassis side rail should be at the back of the IPS 4270-20. The chassis side rail is held in place by the inner latch.

**Step 2** Repeat Step 1 for each chassis side rail.

**Step 3** To remove the chassis side rail, lift the latch, and slide the rail forward.



**Step 4** If you are installing the IPS 4270-20 in a shallow rack, one that is less than 28.5 in. (72.39 cm), remove the screw from the inside of the slide assembly before continuing with Step 5.

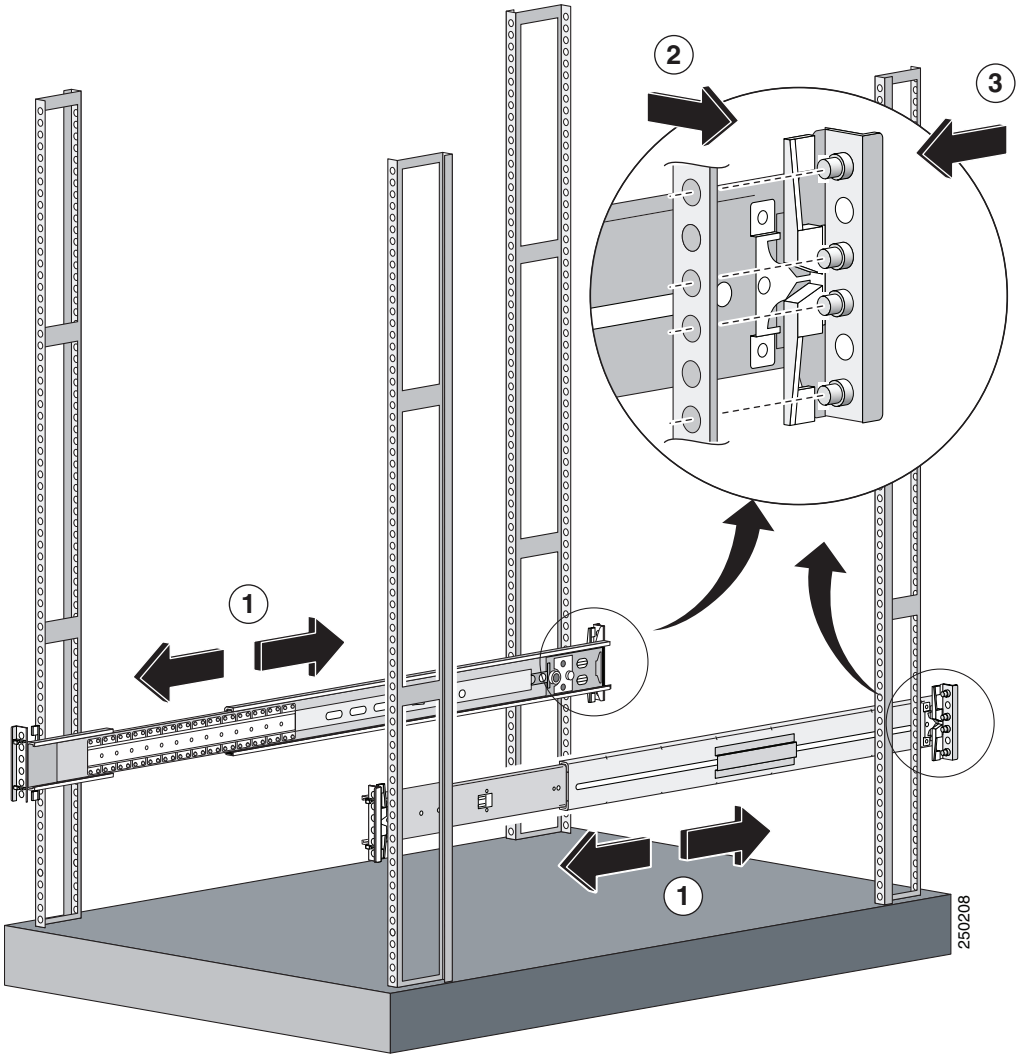


**Step 5** Attach the slide assemblies to the rack.

For round- and square-hole racks:

**a.** Line up the studs on the slide assembly with the holes on the inside of the rack and snap in to place.

**b.** Adjust the slide assembly lengthwise to fit the rack. The spring latch locks the slide assembly into position.



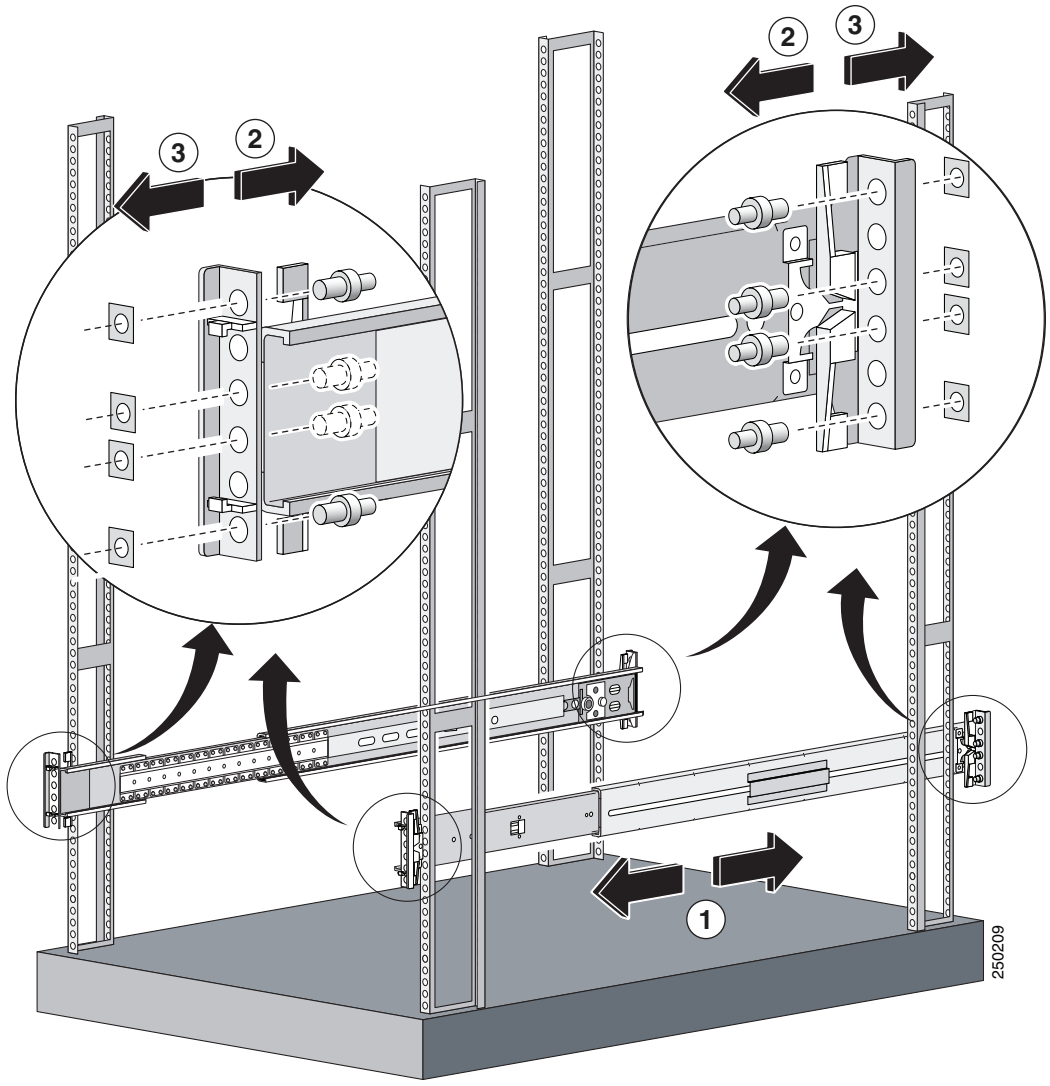

**c.** Repeat for each slide assembly. Make sure the slide assemblies line up with each other in the rack.

**d.** Lift the spring latch to release the slide assembly if you need to reposition it.

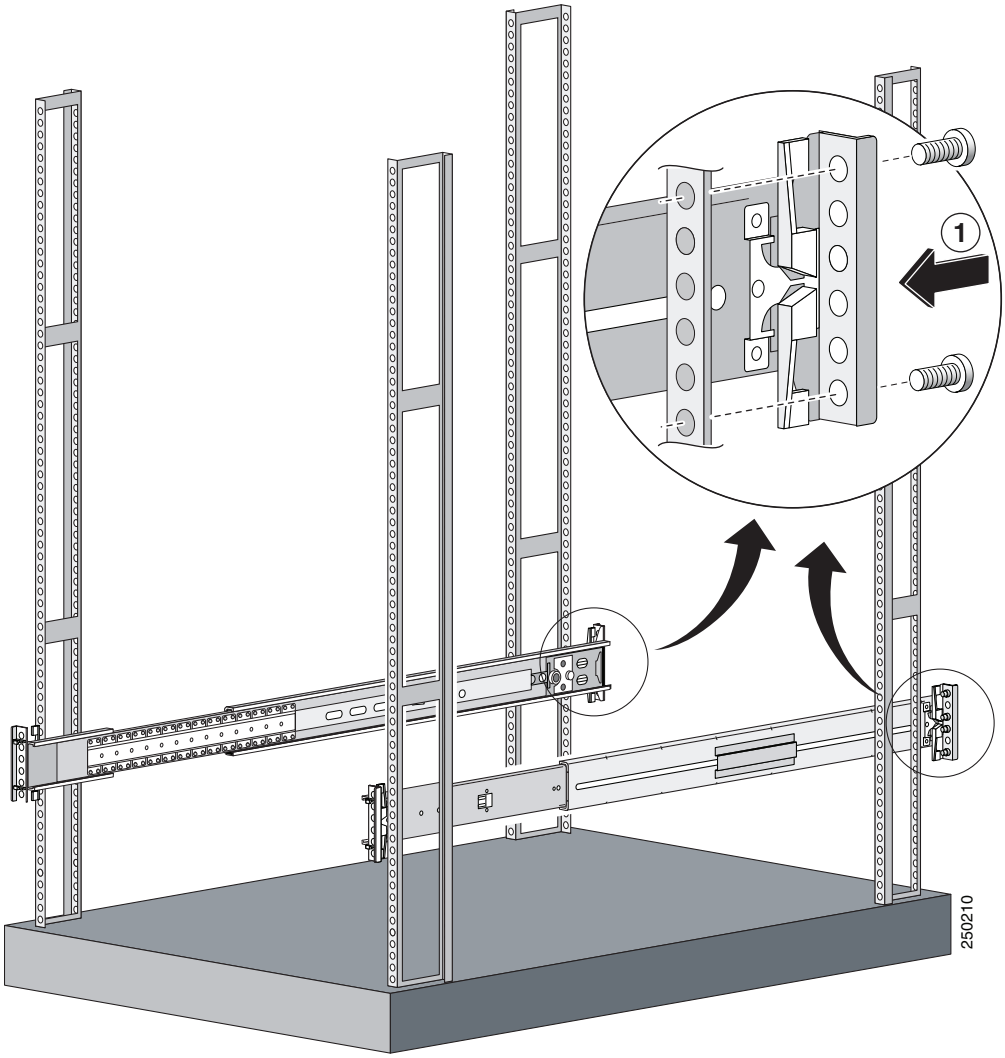
For threaded-hole racks:

**a.** Remove the eight round- or square-hole studs on each slide assembly using a standard screwdriver.

**Note** You may need a pair of pliers to hold the retaining nut.

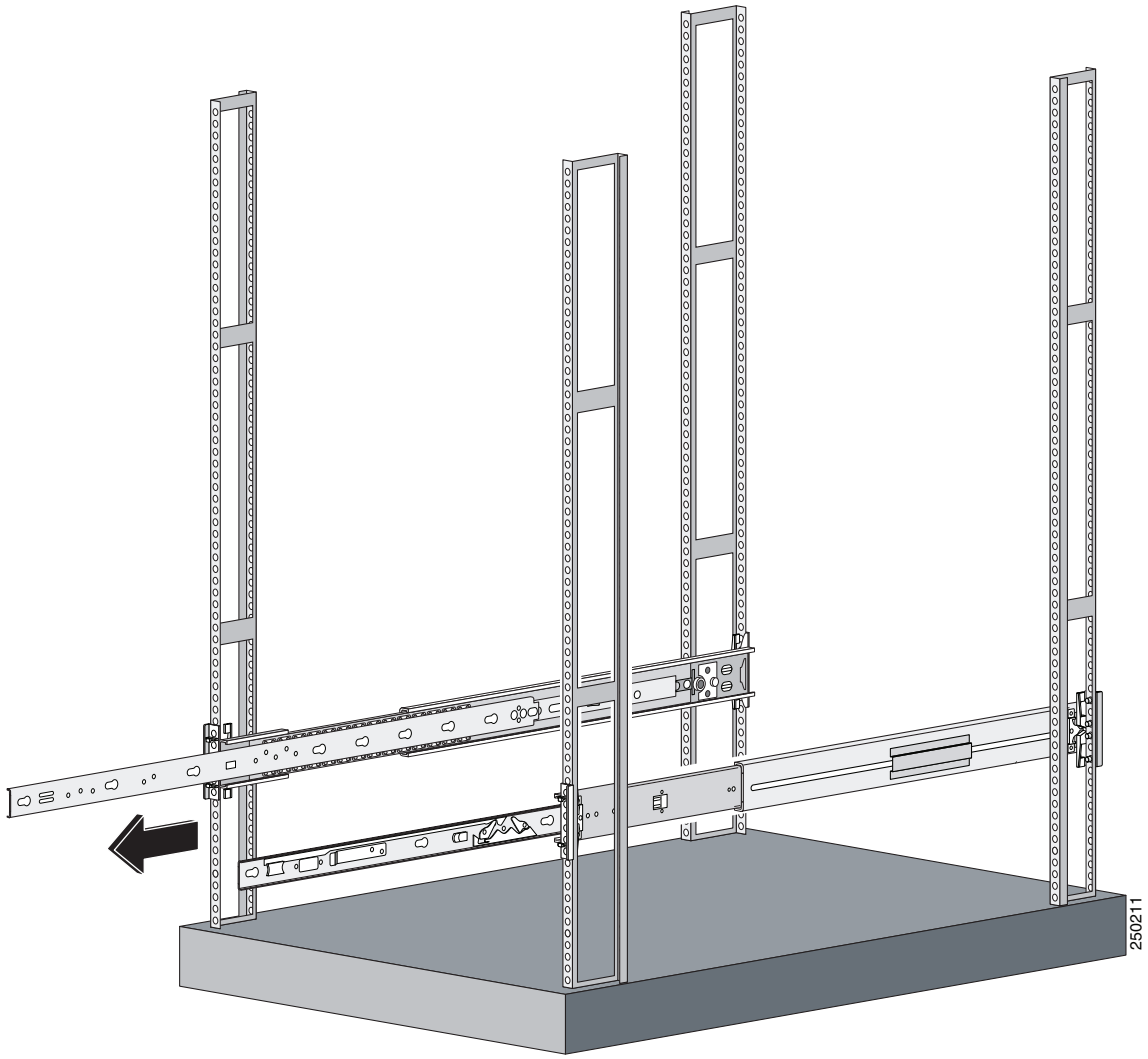


**b.** Line up the bracket on the slide assembly with the rack holes, install two screws (top and bottom) on each end of the slide assembly.

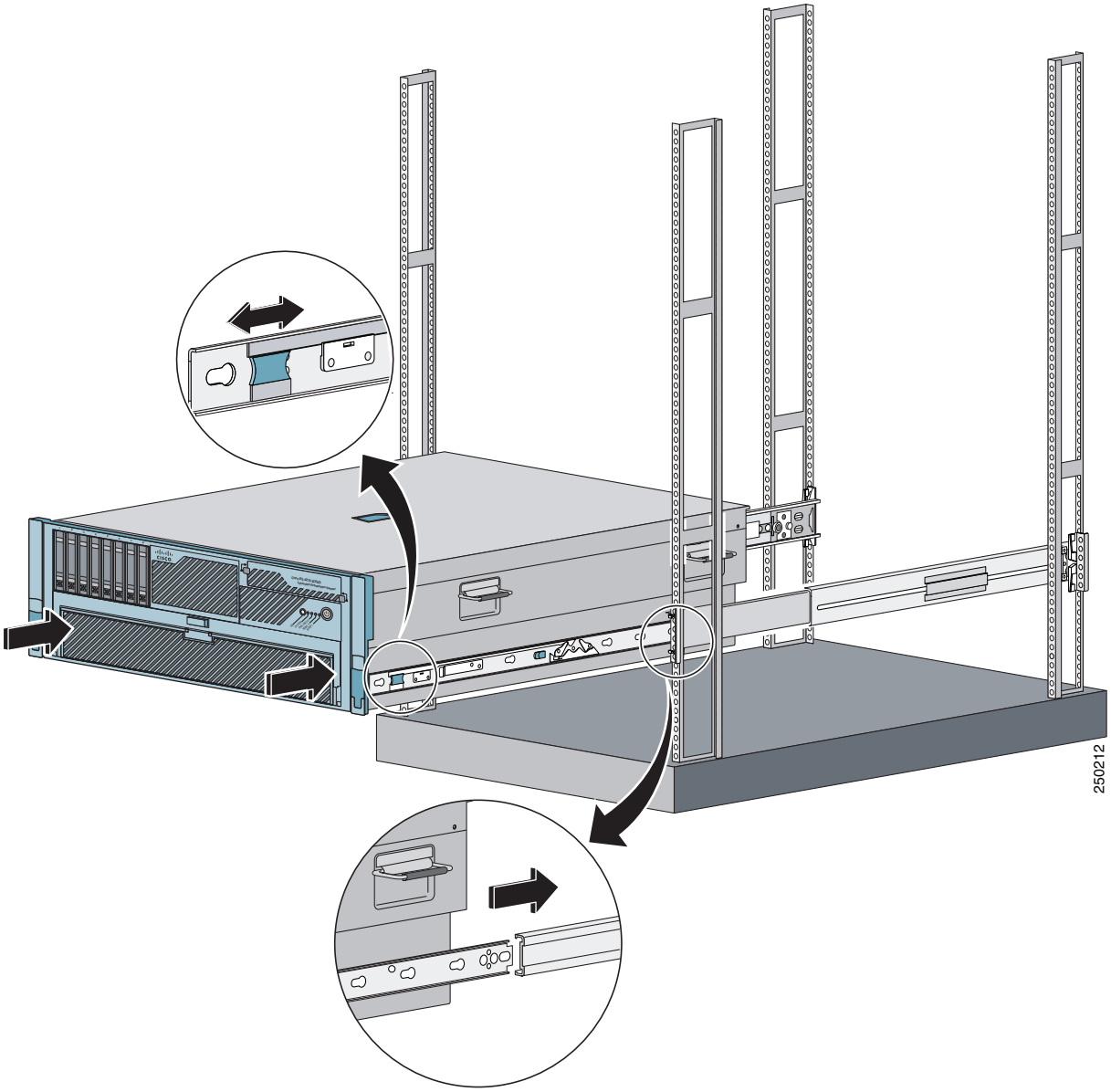



**c.** Repeat for each slide assembly.

**Step 6** Extend the slide assemblies out of the rack.



**Step 7** Align the chassis side rails on the IPS 4270-20 with the slide assembly on both sides of the rack, release the blue slide tab (by either pulling the tab forward or pushing the tab back), and carefully push the IPS 4270-20 in to place.

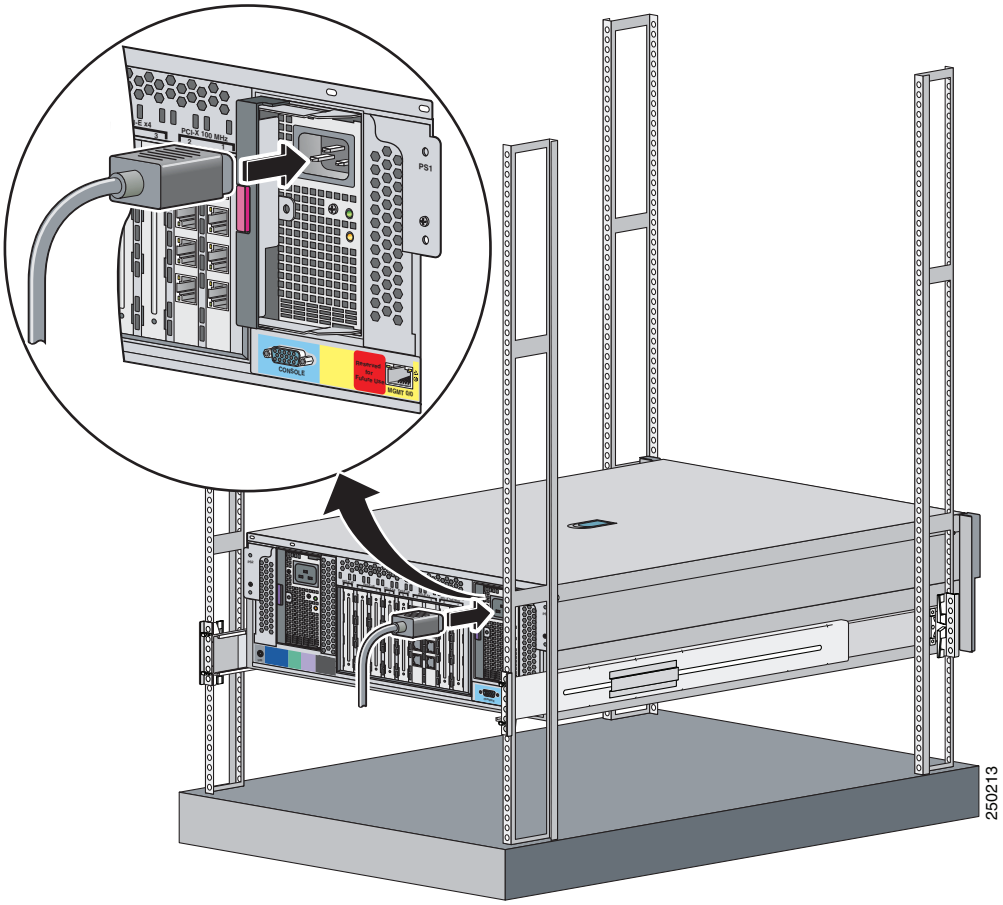



**Caution** Keep the IPS 4270-20 parallel to the floor as you slide it into the rails. Tilting the IPS 4270-20 up or down can damage the slide rails.

**Step 8** If you are using the cable management arm, install it before you connect and route any cables.

**Note** You may also need longer cables when the arm is installed (an extra length of around 3 feet is required).

**Step 9** Install the electrical cables at the back of the IPS 4270-20.




**For More Information**

- For the procedure for installing the cable management arm, see Installing the Cable Management Arm, page 3-28.
- For information on installing connections to the IPS 4270-20, see Installing the IPS 4270-20, page 3-35.

# Extending the IPS 4270-20 from the Rack

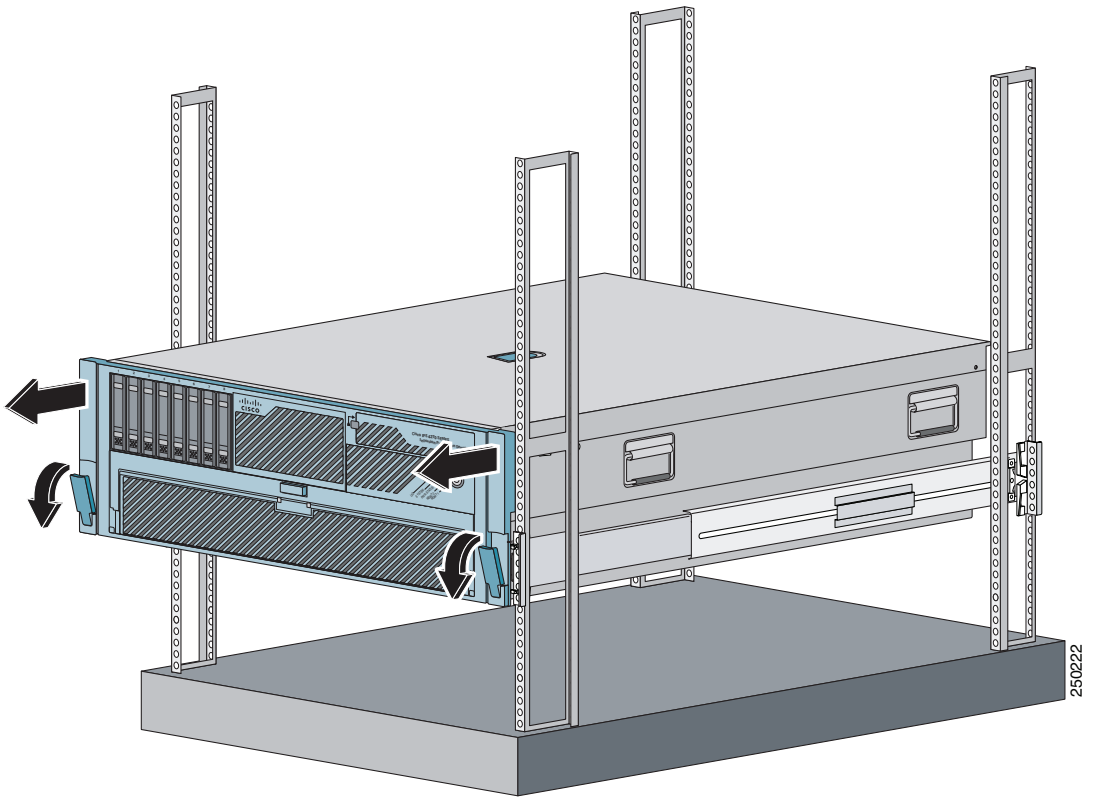
You can extend the IPS 4270-20 from the rack for service or removal.

**Caution** You can only extend the IPS 4270-20 from the rack if the cable management arm is correctly installed with the cables routed through it or if all cables are disconnected from the back of the chassis. Otherwise, you risk damage to the cables and a possible shock hazard if the power cables get caught between the chassis and the rack.

To extend the IPS 4270-20 from the rack, follow these steps:

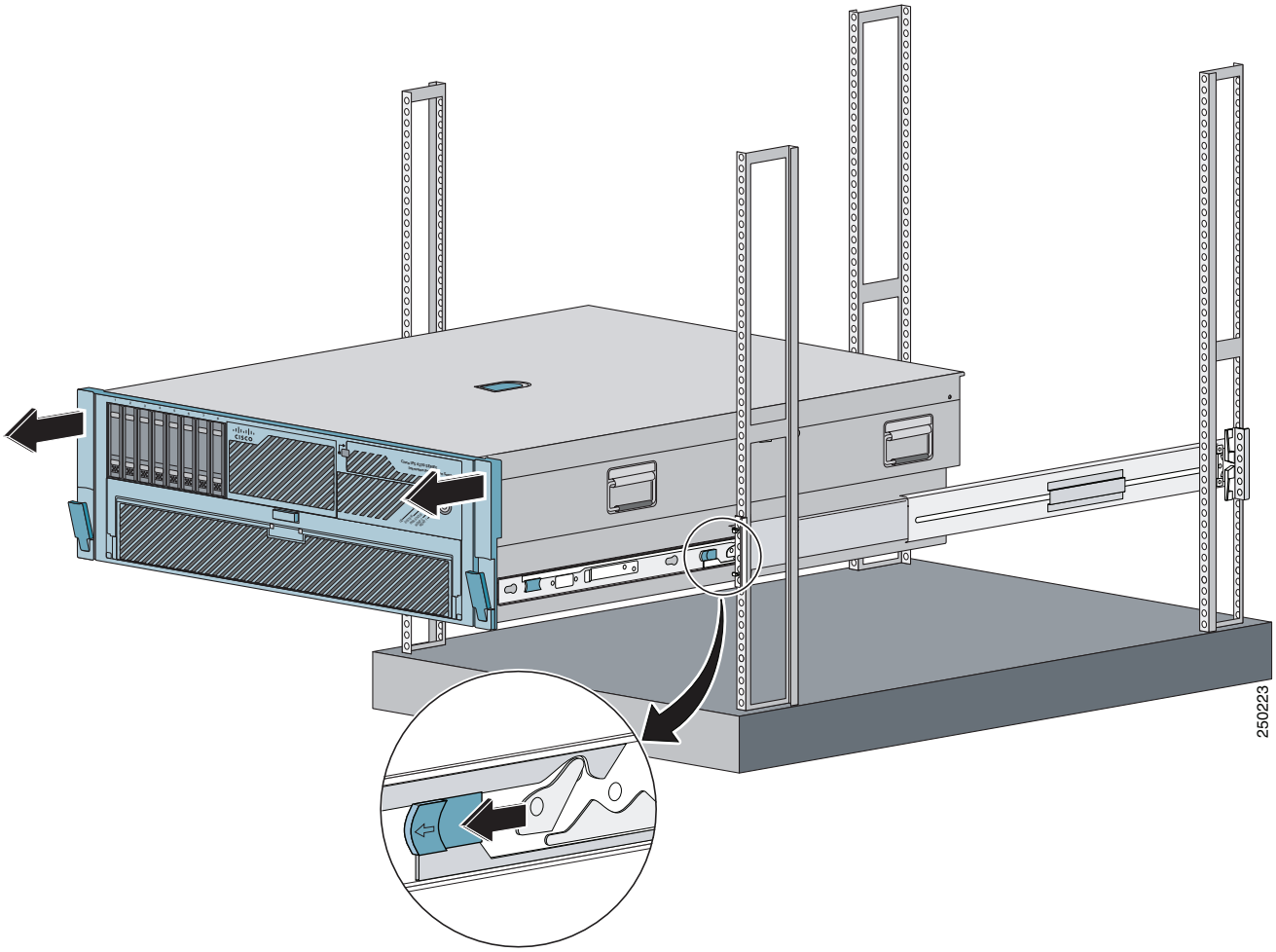
**Step 1** Pull the quick-release levers on each side of the front bezel of the IPS 4270-20 to release it from the rack and extend it on the rack rails until the rail-release latches engage.

**Note** The release latches lock in to place when the rails are fully extended.




**Step 2** After performing the installation or maintenance procedure, slide the IPS 4270-20 in to the rack by pressing the rail-release latches.

**Step 3** To completely remove the IPS 4270-20 from the rack, disconnect the cables from the back of the IPS 4270-20, push the release tab in the middle of the slide assembly forward, and pull the IPS 4270-20 from the rack.

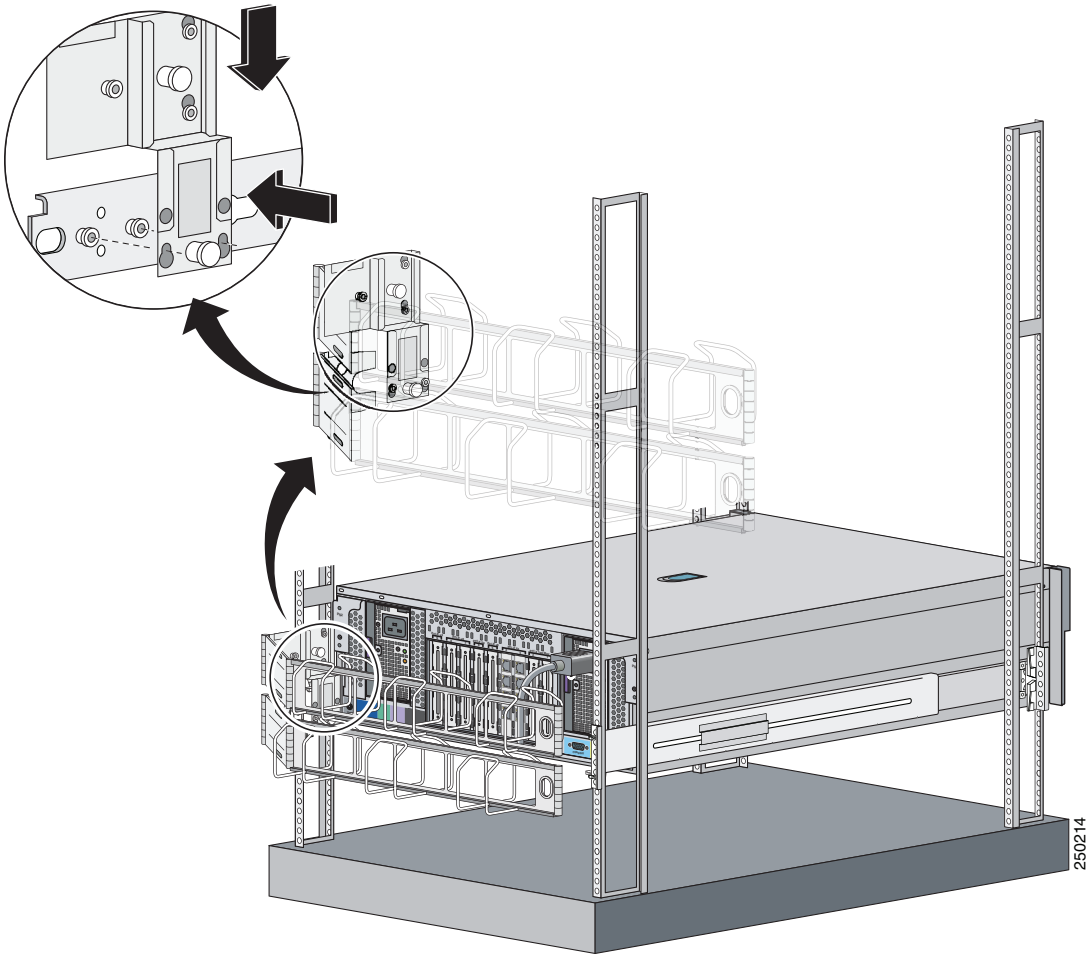



# Installing the Cable Management Arm

**Note** To hinge the cable management arm on the back right-hand side of the rack, see Converting the Cable Management Arm, page 3-32.

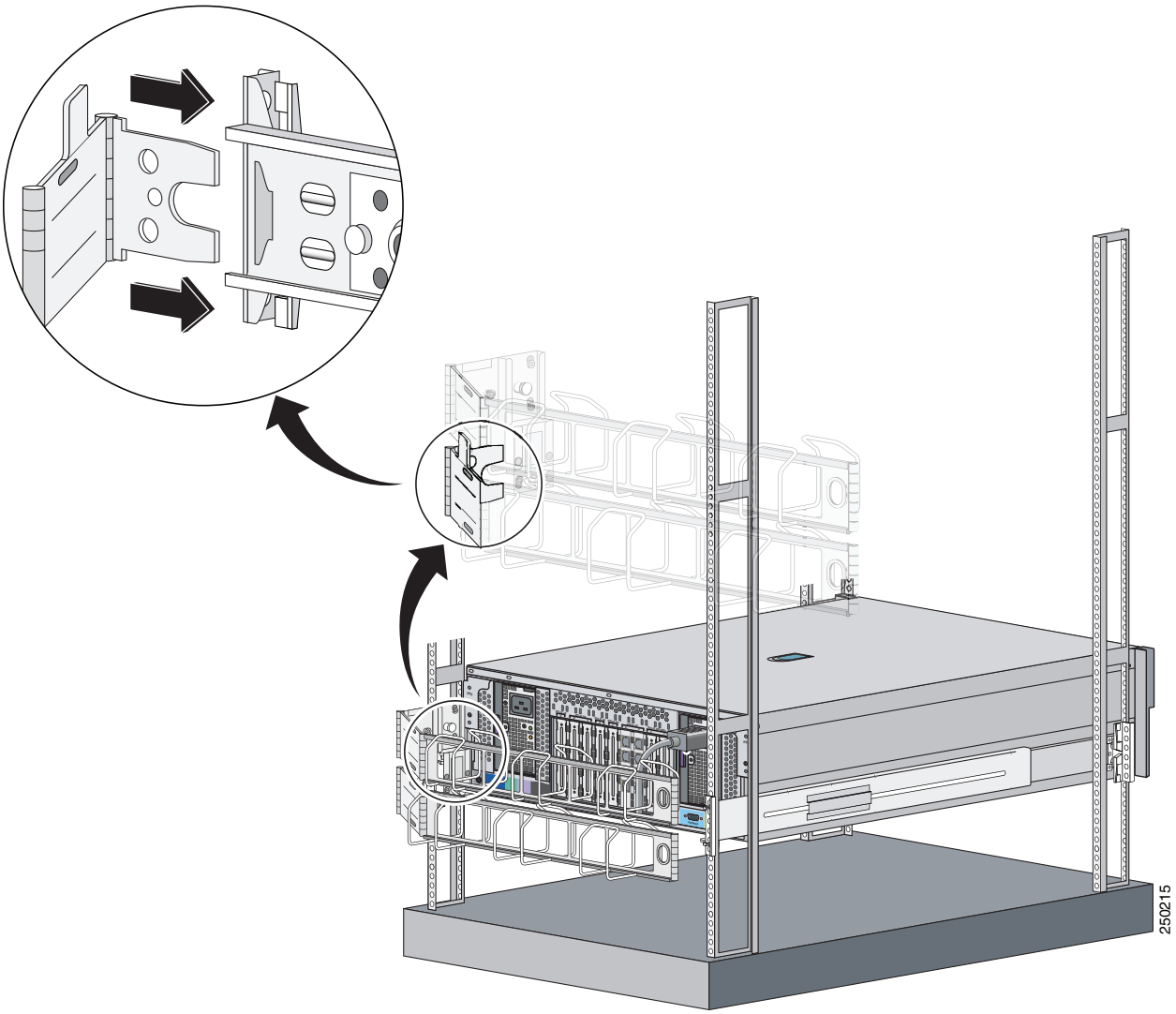
To install the cable management arm, follow these steps:

**Step 1** Align the slide bracket on the cable management arm with the stud on the back of the IPS 4270-20 and align the two studs at the back of the chassis side rail, then slide down and lock in to place.



**Step 2** Attach the cable trough to the back of the rack by pushing the lower metal tab on the cable management arm in to the slide assembly, then lifting the spring pin to lock it in to place.

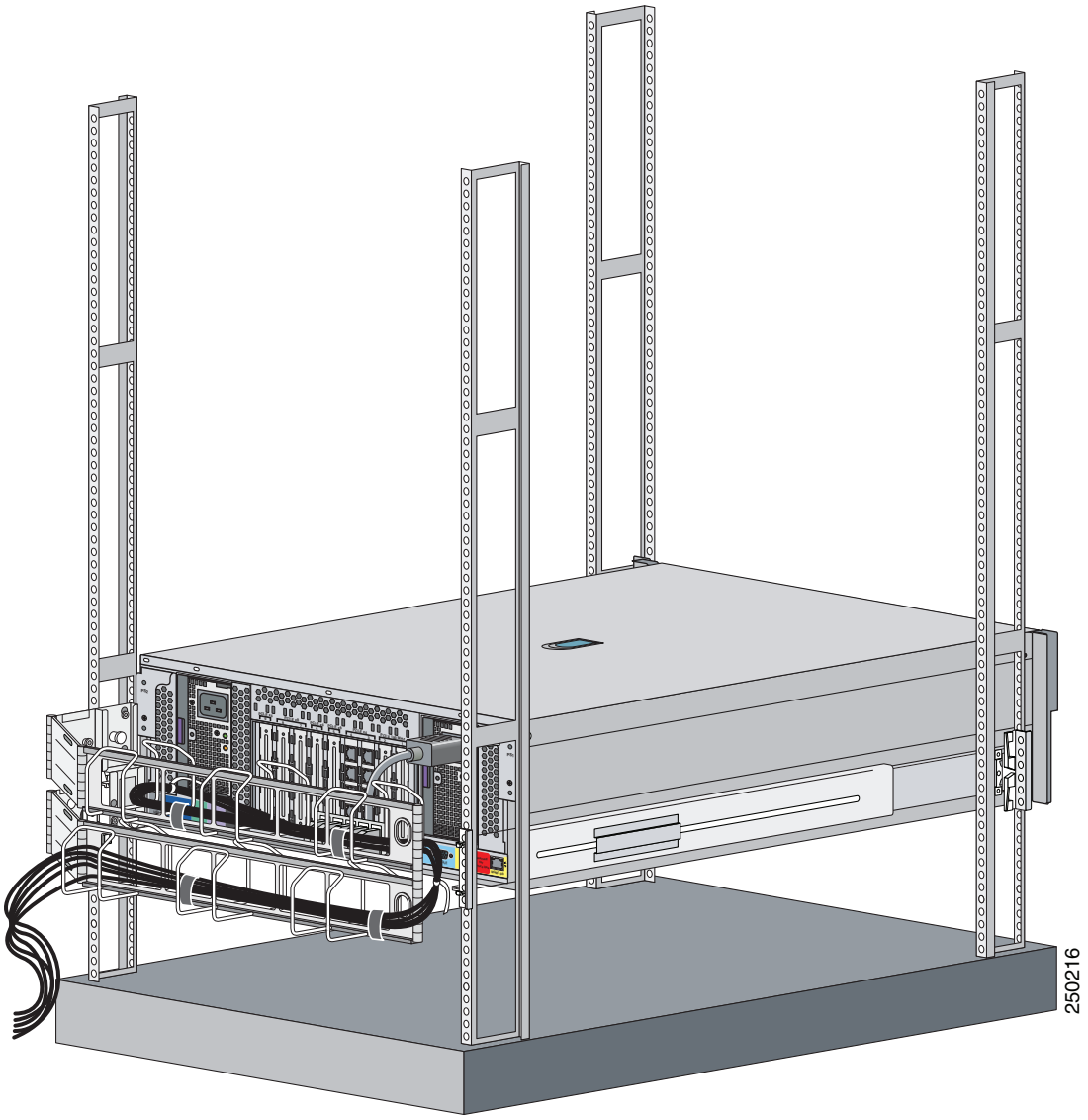
**Caution** Make sure the metal tab is on the outside of the upper part of the cable management arm.




**Note** When properly installed, the cable management arm is attached to the IPS 4270-20 and the rack rail.

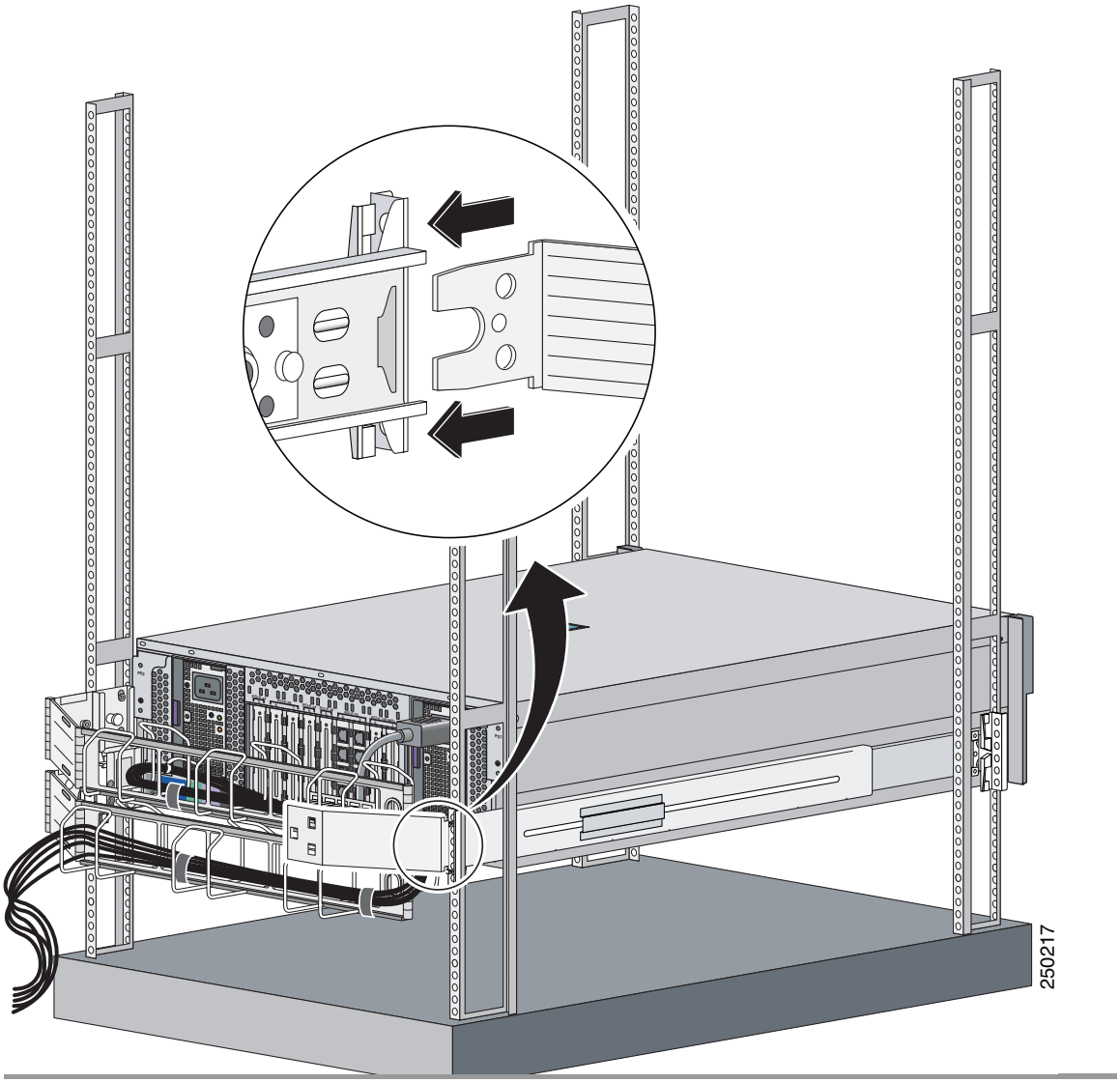
**Step 3** Route the cables through the cable trough and secure the cables with the Velcro straps and black tie wraps.

**Note** After you route the cables through the cable management arm, make sure the cables are not pulled tight when the IPS 4270-20 is fully extended.




**Caution** Do not use the straps and zip ties to tie the two parts of the cable management arm together.

**Step 4** Attach the cable management arm stop bracket to the ride side of the back of the rack by inserting the stop bracket into the cable management arm bracket.



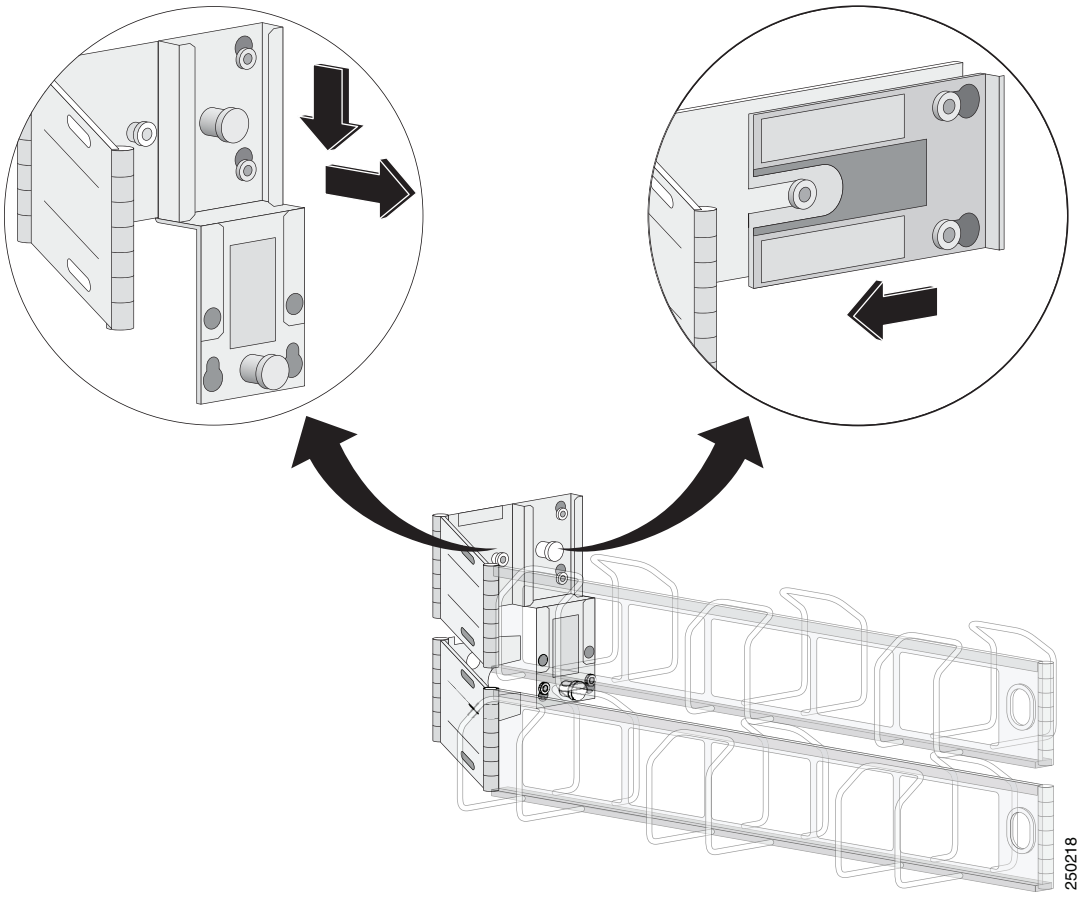

# Converting the Cable Management Arm

**Note** The cable management arm is designed for ambidextrous use. You can convert the cable management arm from a left-hand swing to a right-hand swing.

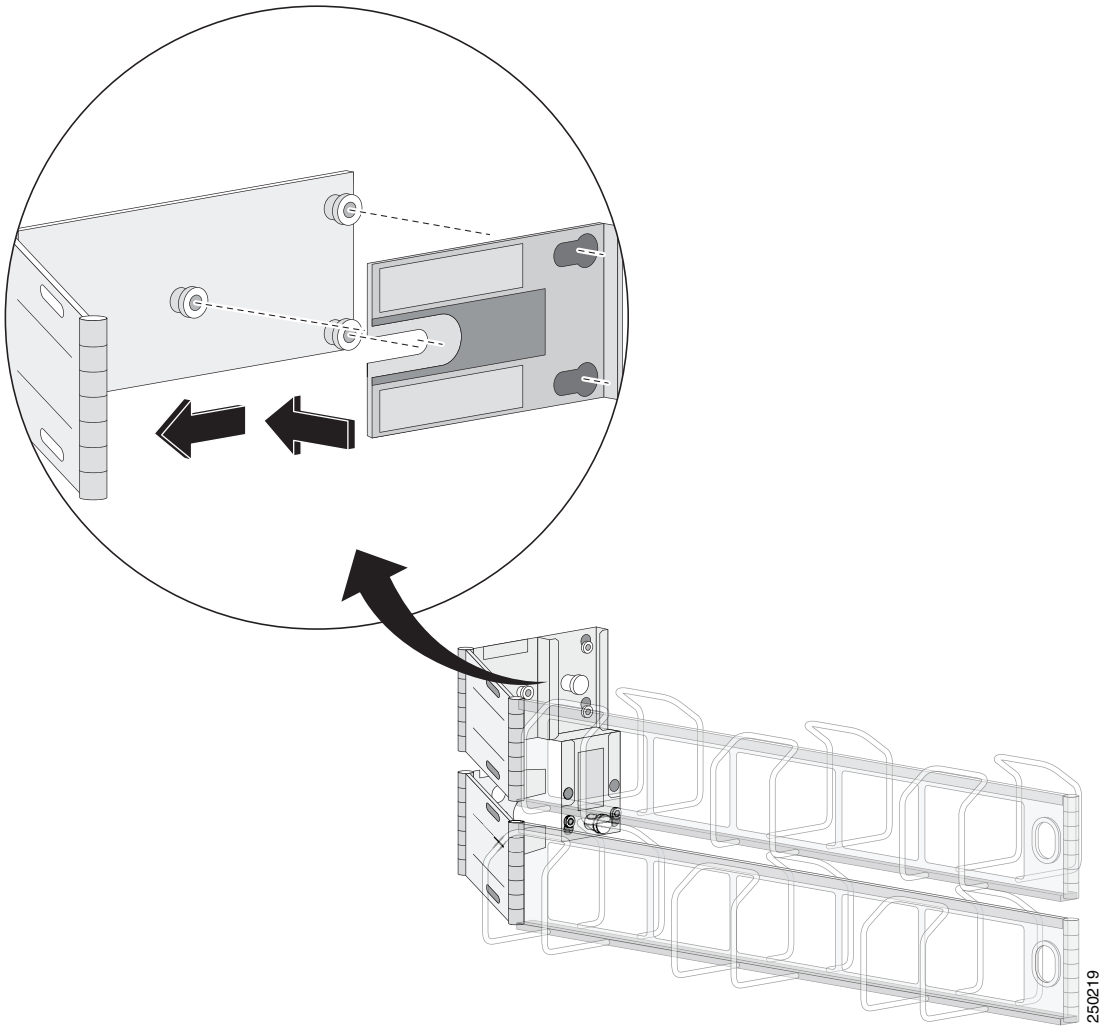
**Note** Make sure to orient the management arm with the cable trough facing upward.

To convert the cable management arm swing, follow these steps:

**Step 1** Pull up the spring pin and slide the bracket off the cable management arm.

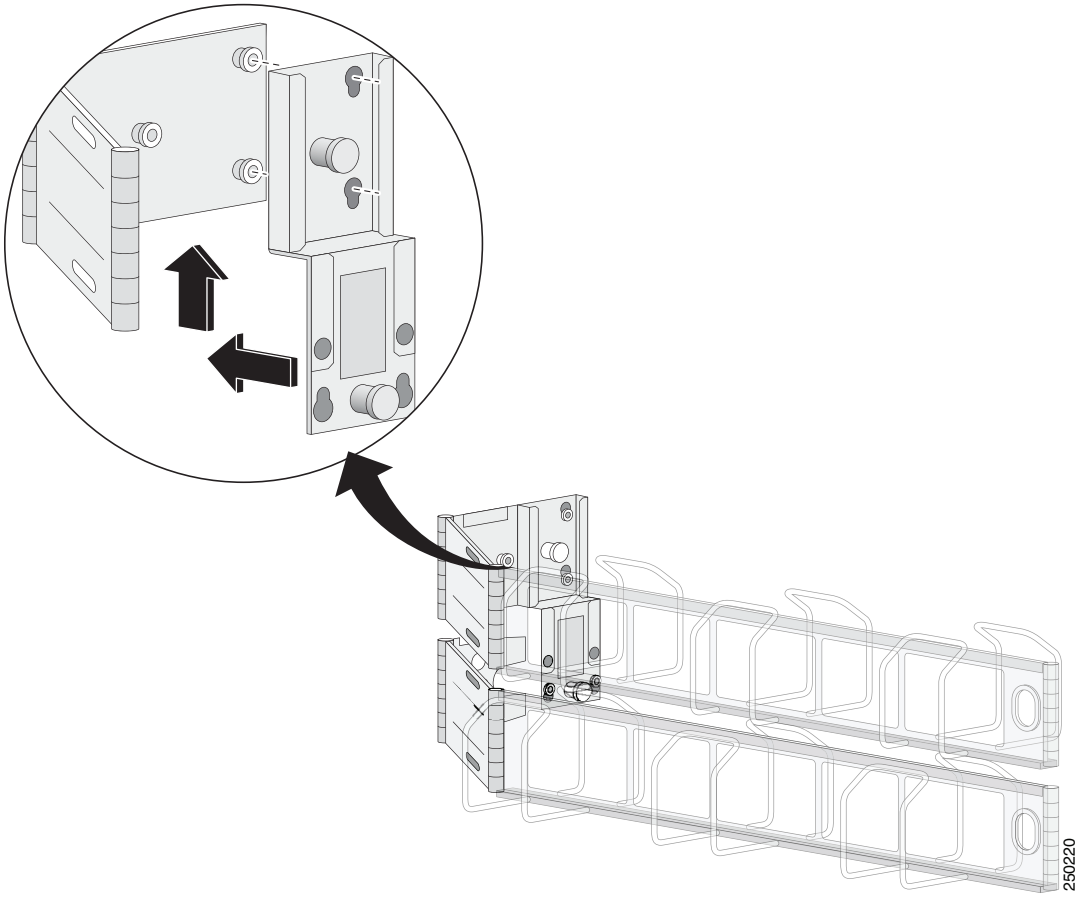


**Step 2** Remove the bottom sliding bracket and flip it over to the top of the bracket aligning the studs.



**Step 3** On the other side of the sliding bracket, align the spring pin with the studs and key holes, and slide until the pin snaps in to place.

**Note** The sliding bracket only fits one way because the hole for the spring pin is offset.




# Installing the IPS 4270-20

**Caution** Follow proper safety procedures when performing these steps by reading the safety warnings in *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4200 Series Appliance Sensor*.

**Warning** **IMPORTANT SAFETY INSTRUCTIONS**

**This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar**

**with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071**

**SAVE THESE INSTRUCTIONS**

**Warning** **Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030**

To install the IPS 4270-20 on the network, follow these steps:

**Step 1** Position the IPS 4270-20 on the network.

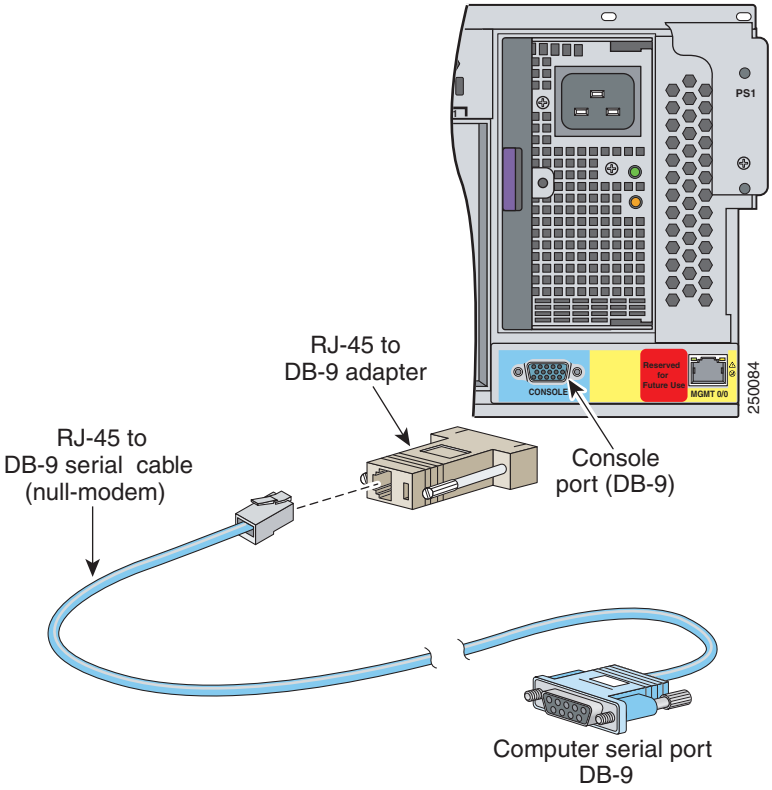
**Step 2** Install the IPS 4270-20 in a rack, if you are rack mounting it.

**Step 3** Connect the cable as shown in Step 4 so that you have either a DB-9 connector on one end as required by the serial port for your computer, and the other end is the RJ-45 connector.

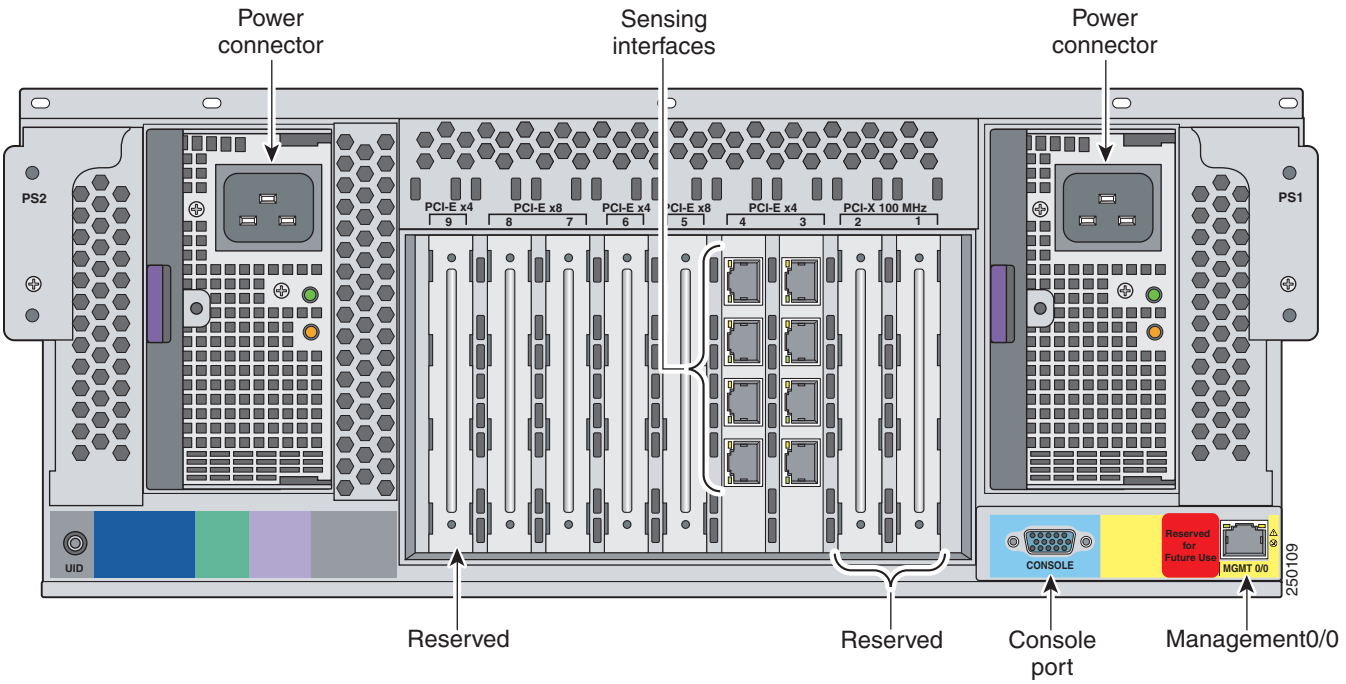
**Note** Use the console port to connect to a computer to enter configuration commands. Locate the serial cable from the accessory kit. The serial cable assembly consists of a 180/rollover cable with RJ-45 connectors (DB-9 connector adapter PN 74-0495-01).

**Note** You can use a 180/rollover or straight-through patch cable to connect the appliance to a port on a terminal server with RJ-45 or hydra cable assembly connections. Connect the appropriate cable from the console port on the appliance to a port on the terminal server.

**Step 4** Connect the RJ-45 to DB-9 adapter connector to the console port and connect the other end to the DB-9 connector on your computer.



**Step 5** Attach the network cables.




The IPS 4270-20 has the following interfaces:

- Management 0/0 (MGMT0/0) is the command and control port.
- GigabitEthernet *slot_number*/*port_number* through GigabitEthernet *slot_number*/*port_number* are the expansion ports.

**Caution** Management and console ports are privileged administrative ports. Connecting them to an untrusted network can create security concerns.

**Step 6** Attach the power cables (there are two power supplies) to the IPS 4270-20 and plug them in to a power source (a UPS is recommended).

**Step 7** Power on the IPS 4270-20.

**Step 8** Initialize the IPS 4270-20.

**Step 9** Upgrade the IPS 4270-20 with the most recent Cisco IPS software. You are now ready to configure intrusion prevention on the IPS 4270-20.

### For More Information

- For more information on working with electrical power and in an ESD environment, see Safety Recommendations, page 2-2.
- For more information on the best place to position your sensor on the network, see Your Network Topology, page 1-3.
- For the procedure for installing the IPS 4270-20 in a rack, see Installing the IPS 4270-20 in the Rack, page 3-18.
- For the instructions for setting up a terminal server, see Connecting an Appliance to a Terminal Server, page 1-22.
- For the procedure for using the **setup** command to initialize the IPS 4270-20, see Chapter B, "Initializing the Sensor.".
- For the procedure for obtaining the most recent Cisco IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.
- For the procedures for configuring intrusion prevention on your sensor, refer to the following guides:
  - *Cisco Intrusion Prevention System Device Manager Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Manager Express Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Sensor CLI Configuration Guide for IPS 7.1*

# Removing and Replacing the Chassis Cover

**Caution** Follow proper safety procedures when performing these steps by reading the safety warnings in *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4200 Series Appliance Sensor*.

**Warning** **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than 120 VAC, 20 A U.S. (240 VAC, 16-20 A International). Statement 1005**

**Warning** **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024**

**Warning** **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029**

**Warning** **This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028**

**Note** Removing the appliance chassis cover does not affect your Cisco warranty. Upgrading the IPS 4270-20 does not require any special tools and does not create any radio frequency leaks.

**Caution** Do not operate the IPS 4270-20 for long periods with the chassis cover open or removed. Operating it in this manner results in improper airflow and improper cooling that can lead to thermal damage.

To remove and replace the chassis cover, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Prepare the IPS 4270-20 to be powered off. Wait for the power down message before continuing with Step 3.

```
sensor# reset powerdown
```

**Note** You can also power off the IPS 4270-20 using the IDM or the IME.

**Step 3** Power off the IPS 4270-20.

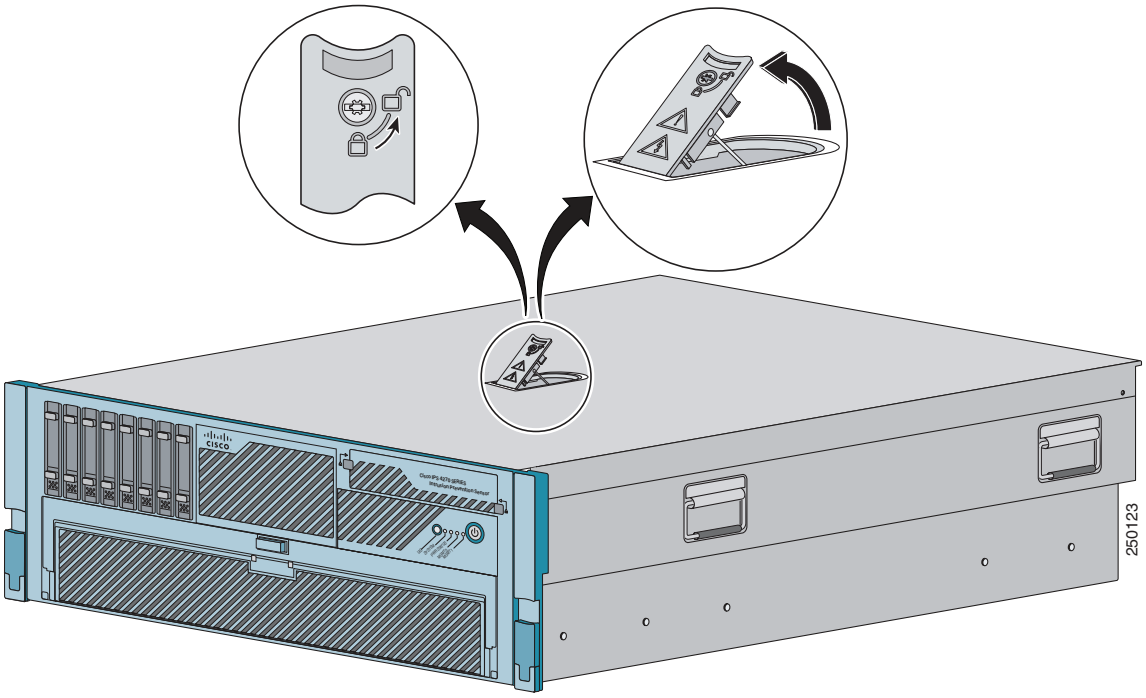
**Step 4** Remove both power cables from the IPS 4270-20.

**Step 5** Extend the IPS 4270-20 out of the rack if it is rack-mounted.

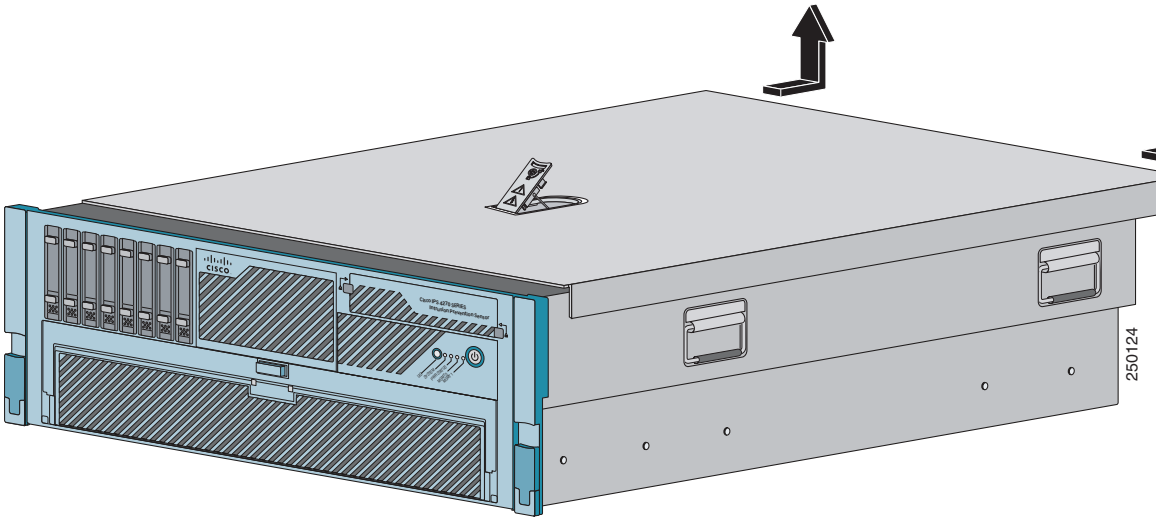
**Step 6** Make sure the IPS 4270-20 is in an ESD-controlled environment.

**Step 7** If the locking latch is locked, use the T-15 Torx screwdriver located on the back of the chassis to unlock it. Turn the locking screw a quarter of a turn counterclockwise to unlock it.

**Step 8** Lift up the cover latch on the top of the chassis.




**Step 9** Slide the chassis cover back and up to remove it.




**Caution** Do not operate the IPS 4270-20 without the chassis cover installed. The chassis cover protects the internal components, prevents electrical shorts, and provides proper air flow for cooling the electronic components.

**Step 10** To replace the chassis cover, position it on top of the chassis and slide it on. Push down on the cover latch to lock into place.

**Note** Make sure the chassis cover is securely locked in to place before powering up the IPS 4270-20.

**Step 11** Reattach the power cables to the IPS 4270-20.

**Step 12** Reinstall the IPS 4270-20 in a rack, on a desktop, or on a table, or extend it back in to the rack.

**Step 13** Power on the IPS 4270-20.

### For More Information

- For the procedure extending the IPS 4270-20 from the rack, see Extending the IPS 4270-20 from the Rack, page 3-26.
- For more information on working in an ESD-controlled environment, see Working in an ESD Environment, page 2-4.
- For the IDM procedure for powering down the IPS 4270-20, refer to Rebooting the Sensor; for the IME procedure for powering down the IPS 4270-20, refer to Rebooting the Sensor.
- For an illustration of the screwdriver and where it is located, see Figure 3-7 on page 3-10.
- For the procedure for installing the power cables on the IPS 4270-20, see Installing the IPS 4270-20, page 3-35.
- If you are reinstalling the IPS 4270-20 in a rack, see Installing the Rail System Kit, page 3-16.

# Accessing the Diagnostic Panel

**Note** When you remove the chassis cover to view the Diagnostic Panel, leave the IPS 4270-20 powered on. Powering off the IPS 4270-20 clears the Diagnostic Panel indicators.

To access the Diagnostic Panel, follow these steps:

**Step 1** Extend the IPS 4270-20 from the rack.

**Step 2** Remove the chassis cover.

**Step 3** Locate the Diagnostic Panel. Follow the instructions in this chapter to remove and install failed components. For aid in troubleshooting, use the internal health indicators information when contacting TAC.

### For More Information

- For the procedure for extending the IPS 4270-20 from the rack, see Extending the IPS 4270-20 from the Rack, page 3-26.
- For the procedure for removing the chassis cover, see Removing and Replacing the Chassis Cover, page 3-39.
- For the location of the Diagnostic Panel, see Figure 3-9 on page 3-13.
- For information on what internal health information each indicator displays on the Diagnostic Panel, see Diagnostic Panel, page 3-14.

# Installing and Removing Interface Cards

**Caution** Follow proper safety procedures when performing these steps by reading the safety warnings in *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4200 Series Appliance Sensor*.

The IPS 4270-20 has nine expansion card slots. Slots 1 and 2 are PCI-X slots and are reserved for future use. Slots 3 through 9 are PCI-Express slots. All slots are full-height slots. Slot 9 is populated by a RAID controller card and is not available for use by network interface cards. The IPS 4270-20 supports two 10GE fiber interface cards, which you can install in any of the supported six slots (slots 3 to 8).

**Caution** To prevent damage to the IPS 4270-20 or the expansion cards, power down the IPS 4270-20 and remove all AC power cables before removing or installing expansion cards.

**Caution** To prevent improper cooling and thermal damage, do not operate the IPS 4270-20 unless all expansion slots have a cover or a card installed.

To install and remove interface cards, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Prepare the IPS 4270-20 to be powered off. Wait for the power down message before continuing with Step 3.

```
sensor# reset powerdown
```

**Note** You can also power off the IPS 4270-20 using the IDM or the IME.

**Step 3** Power off the IPS 4270-20.

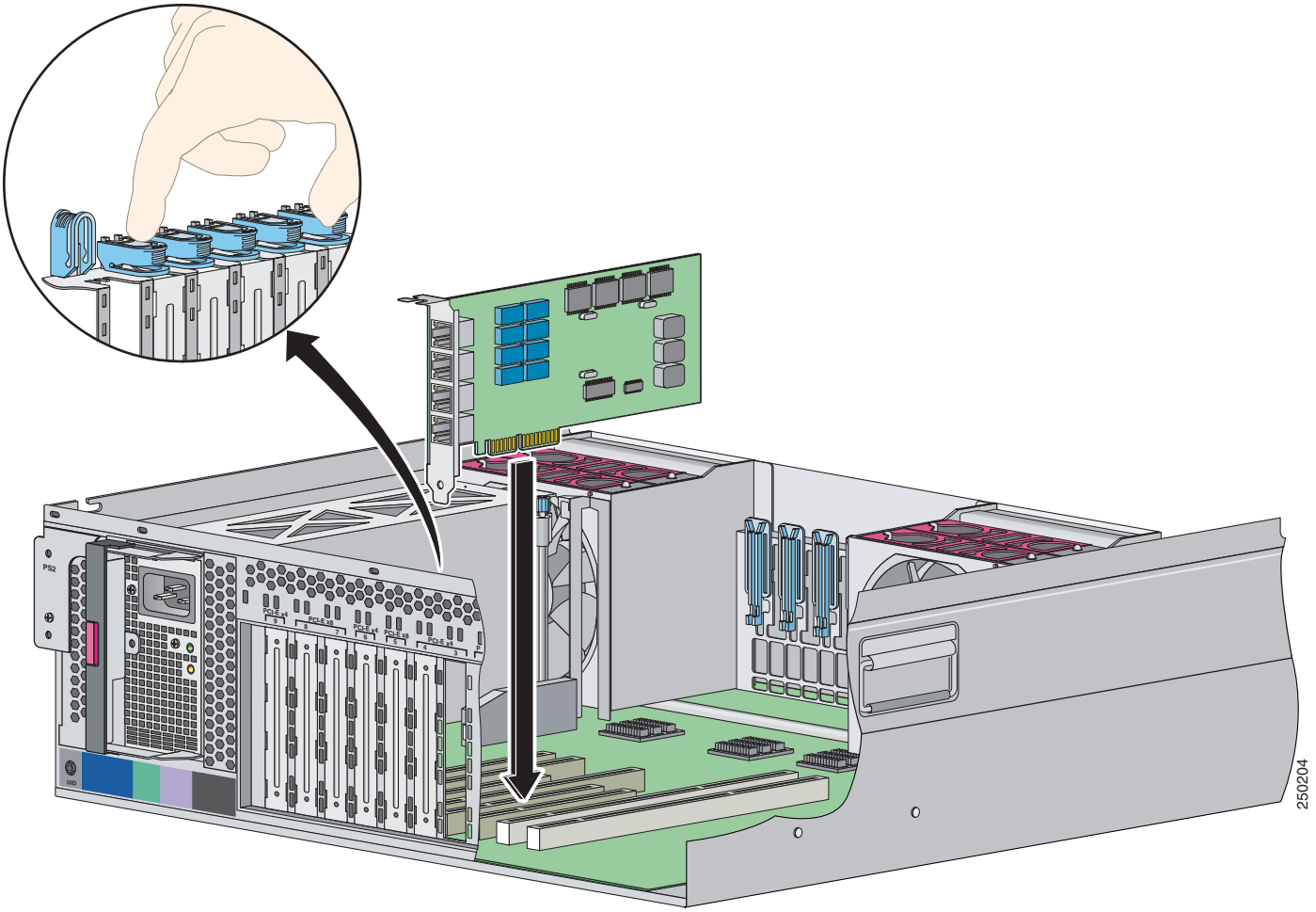
**Step 4** Remove the power cables from the IPS 4270-20.

**Step 5** If rack-mounted, extend the IPS 4270-20 from the rack.

**Step 6** Make sure the IPS 4270-20 is in an ESD-controlled environment.

**Step 7** Remove the chassis cover.

**Step 8** To unlock the expansion card slot, push down on the center part of the blue tab and open the latch.




**Step 9** To uninstall a card, lift the card out of the socket. To install a card, position the card so that its connector lines up over the socket on the mother board and push the card down in to the socket. Press down on the outer edge of the blue tab to lock the card in to place.

**Note** To remove full-length expansion cards, unlock the retaining clip. To install full-length expansion cards, lock the retaining clip.

**Step 10** Replace the chassis cover.

**Step 11** Slide the server back in to the rack by pressing the server rail-release handles.

**Step 12** Reconnect the power cables to the IPS 4270-20.

**Step 13** Power on the IPS 4270-20.

### For More Information

- For an illustration of the expansion card slots, see Figure 3-7 on page 3-10.
- For an illustration of the supported interface cards, see Supported Interface Cards, page 3-4.
- For the IDM procedure for powering down the IPS 4270-20, refer to Rebooting the Sensor; for the IME procedure for powering down the IPS 4270-20, refer to Rebooting the Sensor.
- For the procedure for extending the IPS 4270-20 from the rack, see Extending the IPS 4270-20 from the Rack, page 3-26.
- For more information on working in an ESD-controlled environment, see Working in an ESD Environment, page 2-4.
- For the procedure for removing the chassis cover, see Removing and Replacing the Chassis Cover, page 3-39.

# Installing and Removing the Power Supply

**Caution** Follow proper safety procedures when performing these steps by reading the safety warnings in *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4200 Series Appliance Sensor*.

IPS 4270-20 ships with two hot-pluggable power supplies, thus providing a redundant power supply configuration. You can install or replace either power supply without powering down the IPS 4270-20, as long as one power supply is active and functioning correctly.

**Caution** If only one power supply is installed, do not remove the power supply unless the IPS 4270-20 has been powered down. Removing the only operational power supply causes an immediate power loss.

To install and remove power supplies, follow these steps:

**Step 1** Log in to the CLI.

**Note** Power supplies are hot-pluggable. You can replace a power supply while the IPS 4270-20 is running, if you are replacing a redundant power supply.

**Step 2** Prepare IPS 4270-20 to be powered off (if you only have one active, functioning power supply). Wait for the power down message before continuing with Step 3.

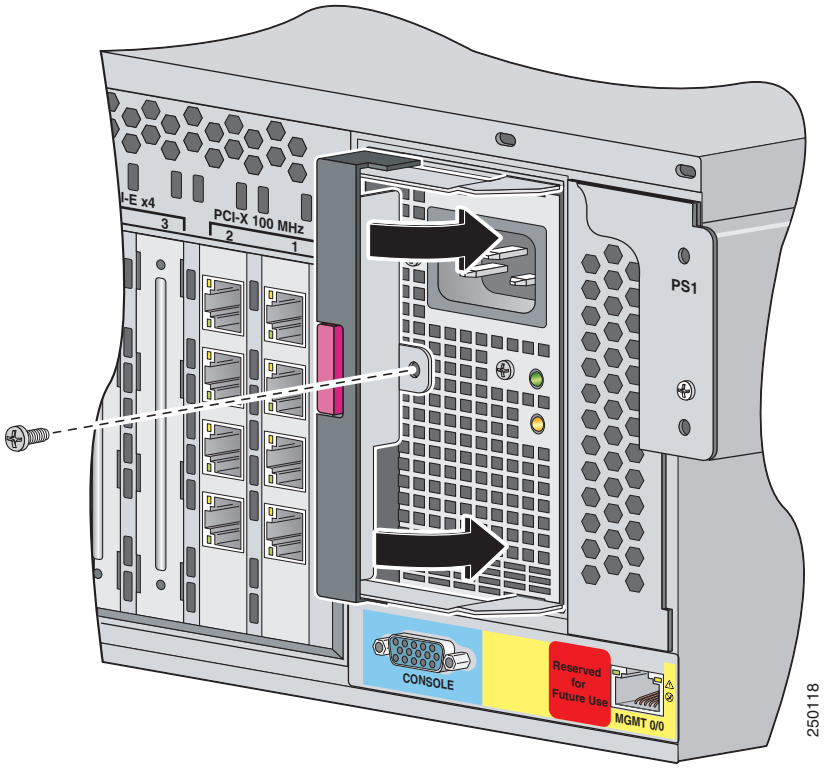
```
sensor# reset powerdown
```

**Note** You can also power off the IPS 4270-20 using the IDM or the IME.

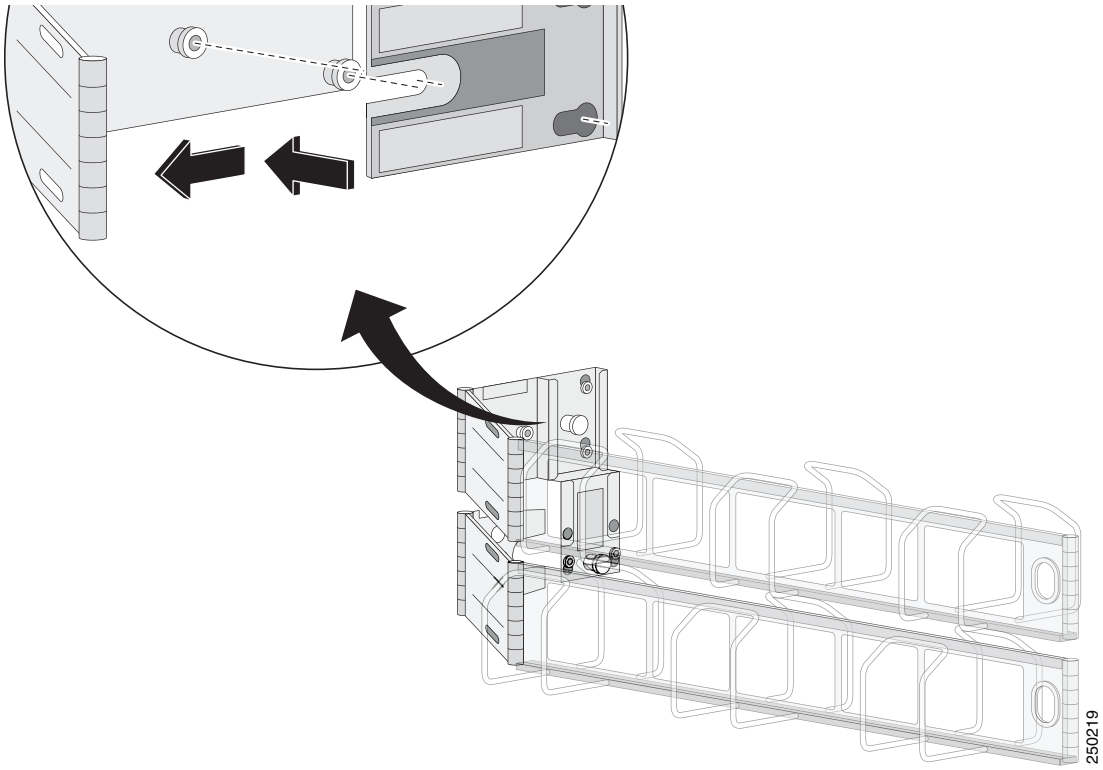
**Step 3** Power off IPS 4270-20 (if you only have one active, functioning power supply).

**Step 4** Remove the power cables from the IPS 4270-20.

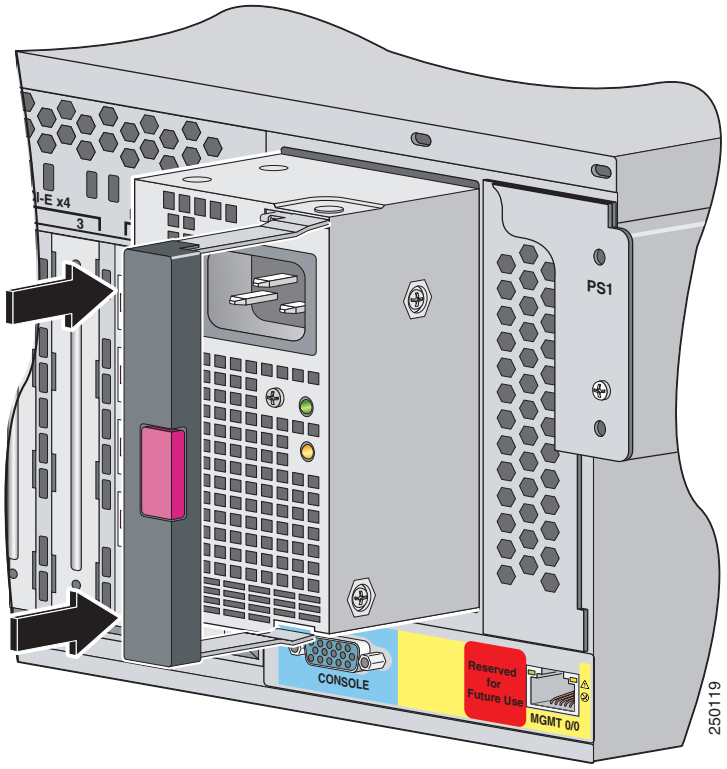
**Step 5** Use the T-15 Torx screwdriver that shipped with the IPS 4270-20 to remove the shipping screw. The T-15 Torx screwdriver is located to the right of power supply.



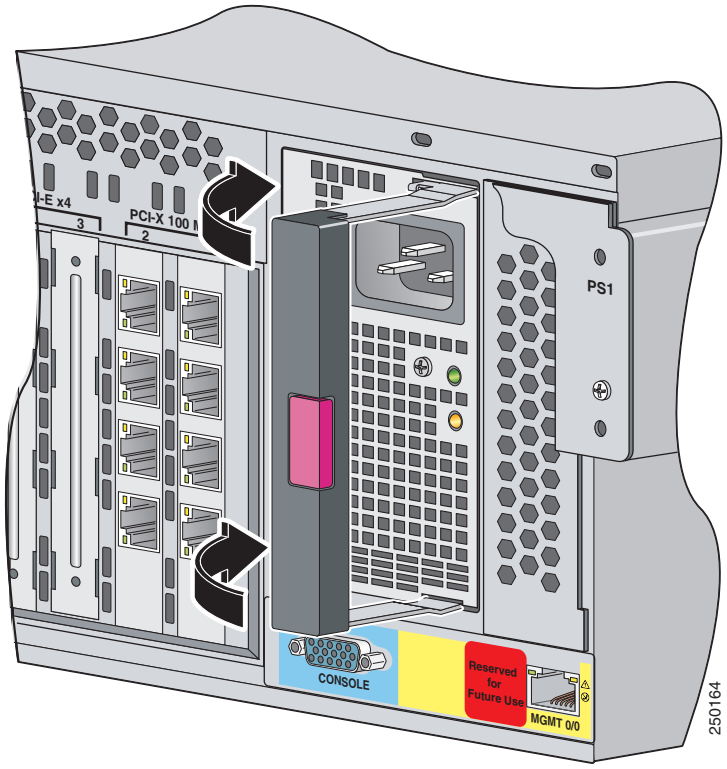
**Step 6** Remove the power supply by pulling it away from the chassis.



**Step 7** Install the power supply. Make sure the handle is open and slide the power supply into the bay.



**Step 8** Lock the power supply handle.




**Step 9** Reconnect the power cables. Be sure that the power supply indicator is green and the front panel health indicator is green.

**Note** Make sure the two power supplies are powered by separate AC power sources so that the IPS 4270-20 is always available.

**Step 10** Power on the IPS 4270-20.

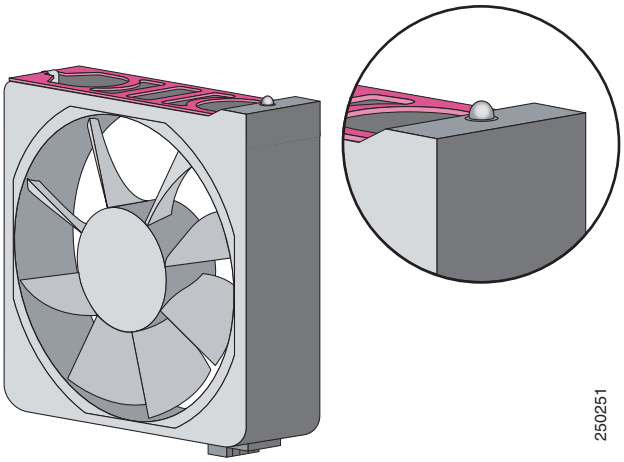
### For More Information

- For the IDM procedure for powering down the IPS 4270-20, refer to Rebooting the Sensor; for the IME procedure for powering down the IPS 4270-20, refer to Rebooting the Sensor.
- For an illustration of the screwdriver and where it is located, see Figure 3-9 on page 3-13.

# Installing and Removing Fans

There are six fans in the IPS 4270-20. The IPS 4270-20 supports redundant hot-pluggable fans in a 5 + 1 configuration to provide proper airflow. Figure 3-12 shows the fan, its connector, and its indicator.

*Figure 3-12 Fan, Connector, and Indicator*




The fan indicators provide the following information:

- Green—Operating normally
- Amber—Failed
- Off— No power

To install and remove fans in the IPS 4270-20, follow these steps:

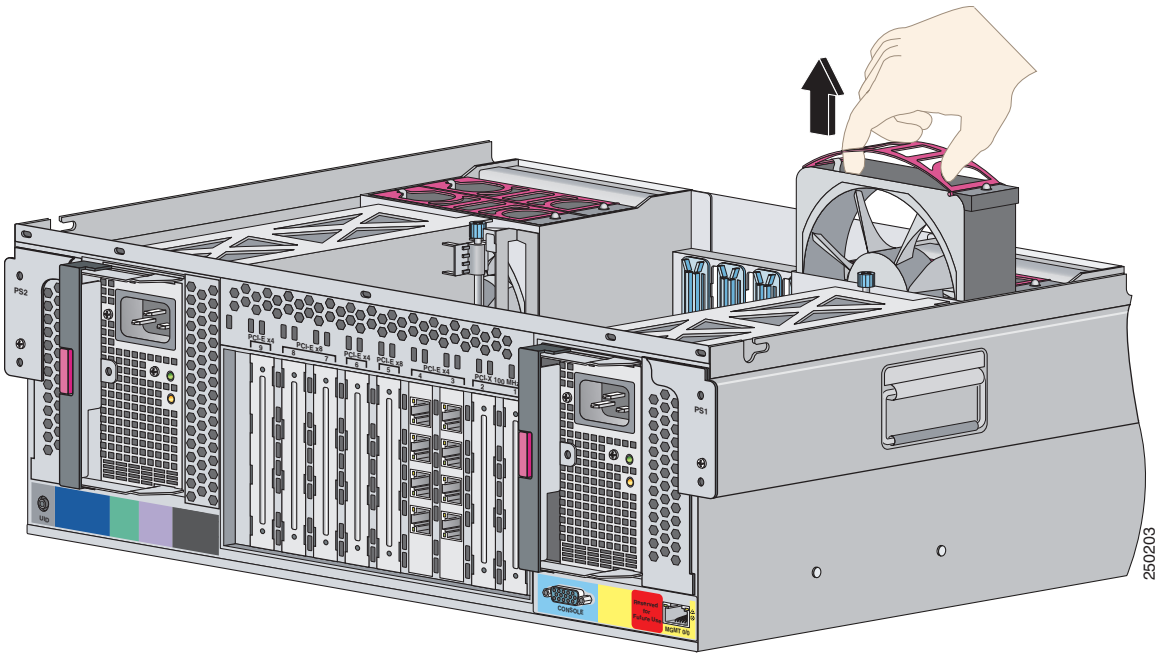
**Step 1** Extend the server from the rack.

**Step 2** Remove the chassis cover.

**Step 3** Identify the failed fan by locating an amber indicator on top of the failed fan or a lighted FAN X indicator on the Diagnostic Panel.

**Step 4** Remove the failed fan by grasping the red plastic handle and pulling up.

**Note** Remove and replace one fan at a time. If the IPS 4270-20 detects two failed fans, it shuts down to avoid thermal damage.




**Step 5** Install a new fan by positioning the fan over the slot so that the connector below the fan indicator lines up with the connection on the motherboard. Push down until the fan clicks in to place.

**Step 6** Make sure the indicator on each fan is green.

**Note** If the front panel internal system health indicator is not green after you install a fan, reseat the fan.

**Step 7** Replace the chassis cover.

**Step 8** Slide the IPS 4270-20 back in to the rack by pressing the rail-release handles.

**Step 9** Power on the IPS 4270-20.

### For More Information

- For the fan locations, see Figure 3-9 on page 3-13.
- For the procedure for extending the IPS 4270-20 from the rack, see Extending the IPS 4270-20 from the Rack, page 3-26.
- For more information about the Diagnostic Panel, see Diagnostic Panel, page 3-14.
- For the procedure for removing the chassis cover, see Removing and Replacing the Chassis Cover, page 3-39.

# Troubleshooting Loose Connections

Perform the following actions to troubleshoot loose connections on sensors:

- Make sure all power cords are securely connected.
- Make sure all cables are properly aligned and securely connected for all external and internal components.
- Remove and check all data and power cables for damage. Make sure no cables have bent pins or damaged connectors.
- Make sure each device is properly seated.
- If a device has latches, make sure they are completely closed and locked.
- Check any interlock or interconnect indicators that indicate a component is not connected properly.
- If problems continue, remove and reinstall each device, checking the connectors and sockets for bent pins or other damage.

# Installing the IPS 4345 and IPS 4360

## Contents

This chapter describes the Cisco IPS 4345 and the IPS 4360, and includes the following sections:


- Installation Notes and Caveats, page 4-1
- Product Overview, page 4-2
- Specifications, page 4-2
- Accessories, page 4-4
- Front and Back Panel Features, page 4-5
- Rack Mount Installation, page 4-9
- Installing the Appliance on the Network, page 4-12
- Removing and Installing the Power Supply, page 4-15


## Installation Notes and Caveats

Pay attention to the following notes and caveats before installing the IPS 4345 and the IPS 4360.

**Note** Read through the entire guide before beginning any of the installation procedures.

**Warning** **Only trained and qualified personnel should install, replace, or service this equipment.** Statement 49

**Caution** Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4300 Series Appliance Sensor* document and follow proper safety procedures when performing the steps in this guide.

# Product Overview

The IPS 4345 delivers 500 Megabits of intrusion prevention performance. You can use the IPS 4345 to protect both half Gigabit subnets and aggregated traffic traversing switches from multiple subnets. The IPS 4345 is a purpose-built device that has support for both copper and fiber NIC environments thus providing flexibility of deployment in any environment. It replaces the IPS 4240 and the IPS 4255.

The IPS 4360 delivers 1 Gigabit of intrusion prevention performance. You can use the IPS 4360 to protect Gigabit subnets and aggregated traffic traversing switches from multiple subnets. The IPS 4360 is a purpose-built device that has support for both copper and fiber NIC environments thus providing flexibility of deployment in any environment. It replaces the IPS 4260.

All connectivity is on the back of the appliance. The IPS 4345 and the IPS 4360 have eight Gigabit Ethernet network ports. The network port numbers increase from right to left and from bottom to top. There is also a built-in management port, a console interface, and 2 USB ports.

The IPS 4345 monitors 500 Megabits of aggregate network traffic on multiple sensing interfaces and is also inline ready. It supports both copper and fiber interfaces. The 500 Mbps performance is traffic combined from all sensing interfaces. The 500 Mbps performance for the IPS 4345 is based on multiple models of common traffic mixes based on common deployment scenarios while running IPS 7.1.(3)E4 software.

The IPS 4360 monitors greater than 1 Gbps of aggregate network traffic on multiple sensing interfaces and is also inline ready. It supports both copper and fiber interfaces. The 1-Gbps performance is traffic combined from all sensing interfaces. The 1-Gbps performance for the IPS 4360 is based on multiple models of common traffic mixes based on common deployment scenarios while running IPS 7.1.(3)E4 software.

# Specifications

Table 4-1 lists the specifications for the IPS 4345 and the IPS 4360.

*Table 4-1 IPS 4345 and IPS 4360 Specifications*

| **Dimensions and Weight** | **IPS 4345** | **IPS 4360** |
|---|---|---|
| Height | 1.67 in (4.2418 cm) | 1.67 in (4.2418 cm) |
| Width | 16.7 in (42.418 cm) | 16.7 in (42.418 cm) |
| Depth | 15.6 in (39.624 cm) | 19.1 in (48.514 cm) |
| Weight | 14.52 lb (6.58616 kg)<br>with 1 power supply | 16.88 lb (7.65663 kg)<br>with 1 power supply<br>18.92 (8.58196 kg)<br>with 2 power supplies |
| Form factor | 1U, 19-inch rack-mountable | 1U, 19-inch rack-mountable |
| **Power** | | |
| Power supply | 400W | 450W |
| Input current (each input) | 4.85A | 100V to 120V~/5A<br>200V to 240V~/2.5A |
| Leakage current (mA) | 3.5mA | 3.5mA |
| Input voltage range | 100 to 240~ VAC | 100 to 120V/200 to 240V~ |
| Rated input frequency | 50 to 60 Hz | 50 to 60Hz |

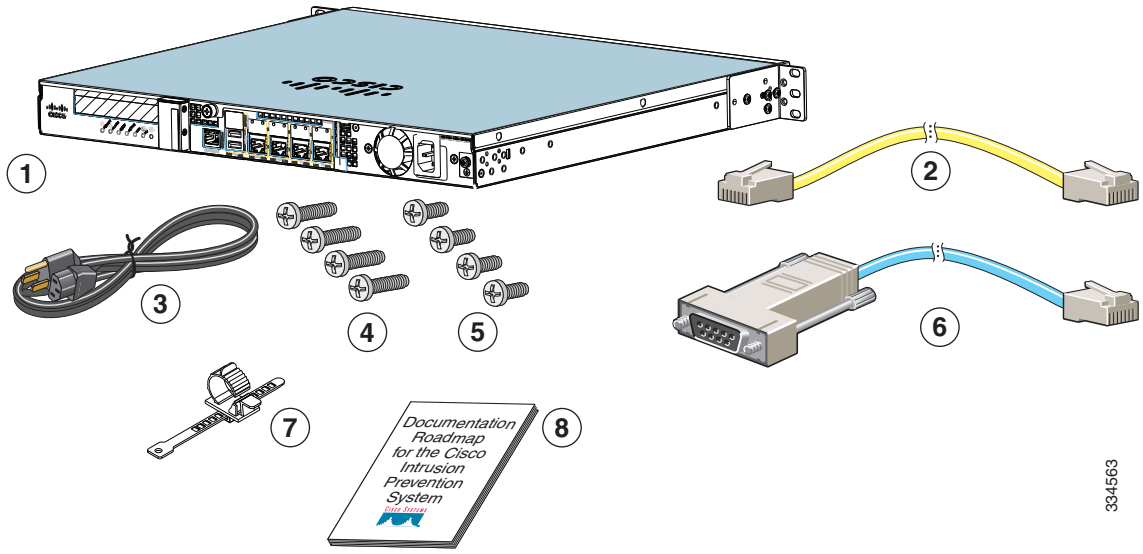
*Table 4-1 IPS 4345 and IPS 4360 Specifications (continued)*

| | | |
|---|---|---|
| Operating power<br>Steady state/maximum | 372W | 382W |
| Total heat dissipation | 730 BTU/hr | 730 BTU/hr |
| Output hold-up time | 20mS | 12mS |
| Inrush current | 40A | 40A |
| **Environment** | | |
| Temperature | Operating: 23°F to 49°F<br>(-5°C to 45°C)<br>Nonoperating: -13°F to -94°F<br>(-25°C to -70°C) | Operating: 23°F to 49°F<br>(-5°C to 45°C)<br>Nonoperating: -13°F to -94°F<br>(25°C to -70°C) |
| Airflow | Front to back | Front to back |
| Relative humidity<br>(noncondensing) | Operating: 0% to 90%<br>Nonoperating: 10% to 90% | Operating: 0% to 90%<br>Nonoperating: 10% to 90% |
| Altitude | Operating: 0 to 10,000 ft<br>(0 to 3048 m)<br>Nonoperating: 0 to 15,000 ft<br>(0 to 4572 m) | Operating: 0 to 10,000 ft<br>(0 to 3048 m)<br>Nonoperating: 0 to 15,000 ft<br>(0 to 4572 m) |
| Acoustic noise | Operating: 64.2<br>Nonoperating: 70G,4.22m/s | Operating: 67.9<br>Nonoperating: 70G,4.22m/s |
| Shock | 50G,2ms | 50G,2ms |
| Vibration | Operating: 0.41Grms,3Hz to 500Hz with spectral break points of 0.0005G2/Hz at 10Hz and 200Hz and 5dB/octave roll-off at each end<br>Nonoperating: 1.12Grms,3Hz to 500Hz with spectral break points of 0.0065G2/Hz at 10Hz and 100Hz and 5dB/octave roll-off at each end | Operating: 0.41Grms,3Hz to 500Hz with spectral break points of 0.0005G2/Hz at 10Hz and 200Hz and 5dB/octave roll-off at each end.<br>Nonoperating: 1.12Grms,3Hz to 500Hz with spectral break points of 0.0065G2/Hz at 10Hz and 100Hz and 5dB/octave roll-off at each end |

# Accessories

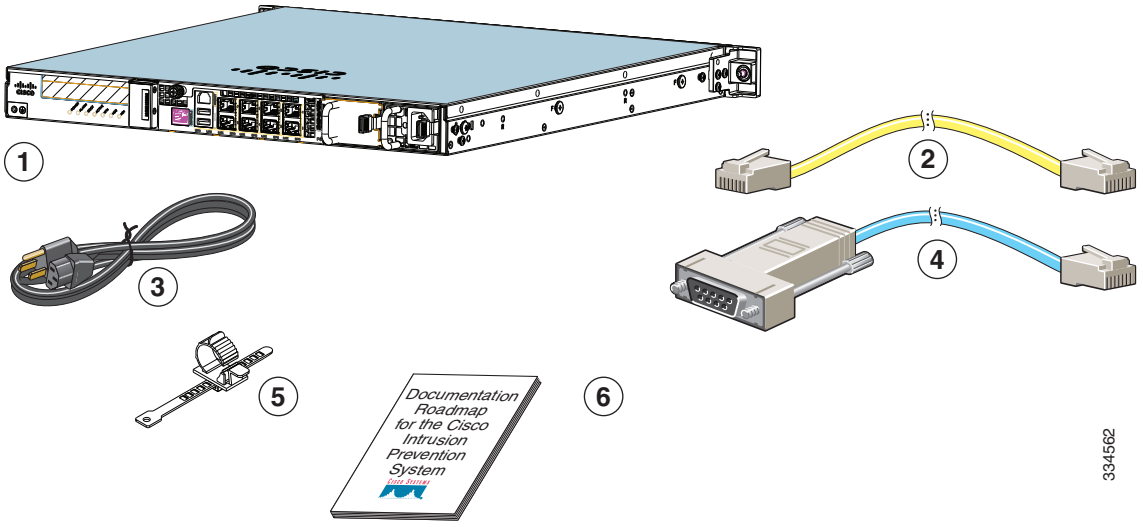
Figure 4-1 and Figure 4-2 display the contents of the sensor packing box, which contains the items you need to install the sensor.

*Figure 4-1 IPS 4345 Packing Box Contents*




| | | | |
|---|---|---|---|
| **1** | Sensor chassis | **2** | Yellow Ethernet cable |
| **3** | Power cord | **4** | 4 10-32 Phillips screws |
| **5** | 4 12-24 Phillips screws | **6** | Blue console cable PC terminal adapter |
| **7** | Power cord retainer | **8** | Documentation |

*Figure 4-2 IPS 4360 Packing Box Contents*

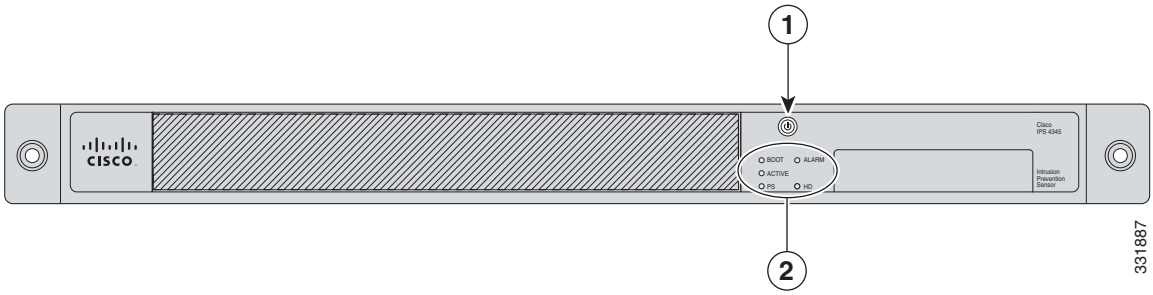



| | | | |
|---|---|---|---|
| **1** | Sensor chassis (one power supply shown) | **2** | Yellow Ethernet cable |
| **3** | Power cord | **4** | Blue console cable PC terminal adapter |
| **5** | Power cord retainer | **6** | Documentation |
| | Not shown: Slide rail kit | | |

# Front and Back Panel Features

This section describes the IPS 4345 and IPS 4360 front and back panel features and indicators. Figure 4-3 shows the front view of the IPS 4345 and IPS 4360.

*Figure 4-3 IPS 4345 and IPS 4360 Front Panel View*




| | | | |
|---|---|---|---|
| **1** | Power button | **2** | Indicators |

Figure 4-4 shows the indicators for the IPS 4345. These indicators are also found on the back panel of the IPS 4345.

***Figure 4-4 IPS 4345 Indicators***

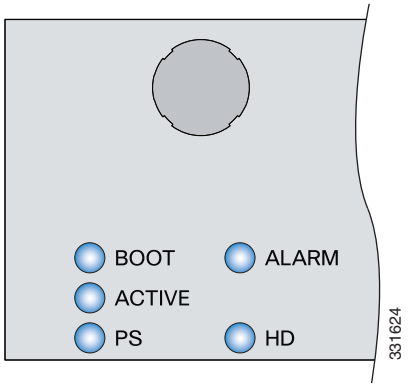



Figure 4-5 shows the indicators for the IPS 4360. These indicators are also found on the back panel of the IPS 4360.

***Figure 4-5 IPS 4360 Indicators***

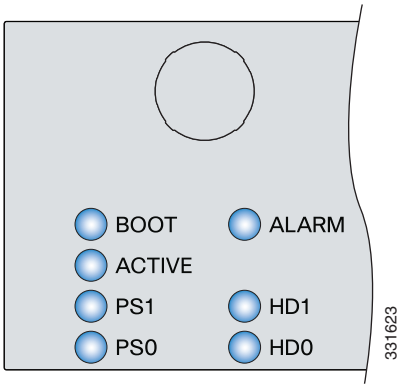



Table 4-2 describes the indicators on the IPS 4345 and IPS 4360.

***Table 4-2 IPS 4345 and IPS 4360 Indicators***

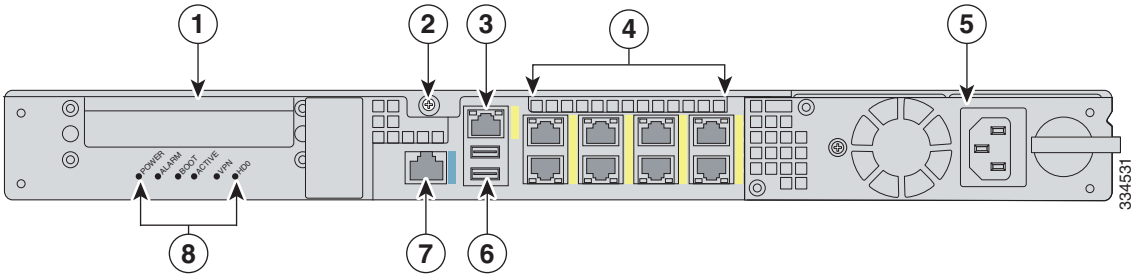
| Indicator | Description |
|---|---|
| BOOT | Indicates how the power-up diagnostics are proceeding:<br>• Flashing green—Power-up diagnostics are running or the system is booting.<br>• Green—System has passed power-up diagnostics.<br>• Amber—Power-up diagnostics failed. |
| ACTIVE | Indicates whether the system is off or on:<br>• Off—No power.<br>• Green—System has power. |

*Table 4-2 IPS 4345 and IPS 4360 Indicators (continued)*

| Indicator | Description |
|---|---|
| PS1 | Indicates the state of the power supply module installed on the right when facing the back panel:<br>• Off—No power supply module present or no AC input.<br>• Green—Power supply module present, on, and good.<br>• Amber—Power or fan module off or failed. |
| PS0 | Indicates the state of the power module installed on the left when facing the back panel:<br>• Off—No power supply module present or no AC input.<br>• Green—Power supply module present, on, and good.<br>• Amber—Power or fan module off or failed. |
| ALARM | Indicates whether a component has failed:<br>• Off—No alarm.<br>• Flashing yellow—Critical alarm.<br>Major failure of hardware component or software module, temperature over the limit, power out of tolerance, or OIR is ready to remove the module. |
| HD1 | N/A |
| HD2 | N/A |

Figure 4-6 shows the back panel features of the IPS 4345.

*Figure 4-6 IPS 4345 Back Panel Features*

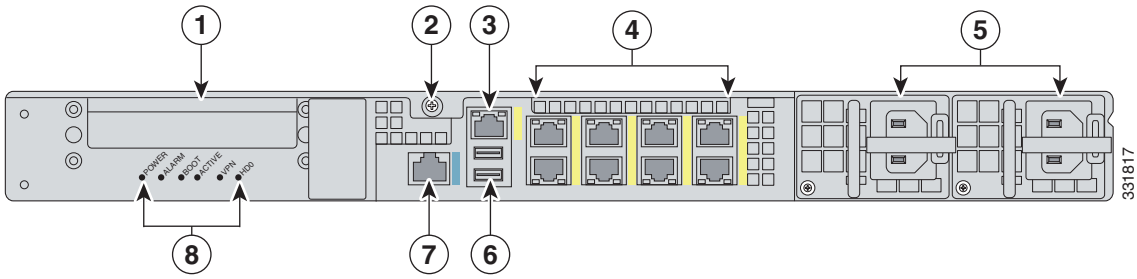



| | | | |
|---|---|---|---|
| **1** | Reserved for future use | **2** | Chassis cover removal screw |
| **3** | Management port[1] | **4** | Network interface ports<br>GigabitEthernet interfaces from right to left and top to bottom:<br>0/7 0/5 0/3 0/1<br>0/6 0/4 0/2 0/0 |
| **5** | Power supply module | **6** | USB ports |
| **7** | Serial console port[2] | **8** | Indicators |

1. The Management 0/0 interface is a GigabitEthernet interface that supports FastEthernet and is designed for management traffic only.
2. The serial console port uses 9600 baud, 8 data bits, 1 stop bit, and no parity.

Figure 4-7 shows the back panel features of the IPS 4360.

***Figure 4-7 IPS 4360 Back Panel Features***




| | | | |
|---|---|---|---|
| **1** | Reserved for future use | **2** | Chassis cover removal screw |
| **3** | Management port[1] | **4** | Network interface ports<br>GigabitEthernet interfaces from right to left and top to bottom:<br>0/7 0/5 0/3 0/1<br>0/6 0/4 0/2 0/0 |
| **5** | Power supply modules | **6** | USB ports |
| **7** | Serial console port[2] | **8** | Indicators |

1. The Management 0/0 interface is a GigabitEthernet interface that supports FastEthernet and is designed for management traffic only.
2. The serial console port uses 9600 baud, 8 data bits, 1 stop bit, and no parity.

Table 4-3 describes the rear MGMT and network interface indicators.

***Table 4-3 Management and Network Interface Indicators***

| Indicator | | Description |
|---|---|---|
| Left side | Green<br>Flashing green | Physical activity<br>Network activity |
| Right side | Not lit<br>Green<br>Amber | 10 Mbps<br>100 Mbps<br>1000 Mbps |

# Rack Mount Installation

This section describes how to rack mount the 4300 series chassis, and contains the following topics:


- Rack-Mounting Guidelines, page 4-9
- Installing the IPS 4345 in a Rack, page 4-10
- Mounting the IPS 4345 and IPS 4360 in a Rack with the Slide Rail Mounting System, page 4-11


## Rack-Mounting Guidelines

**Warning** **Warning To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety: This unit should be mounted at the bottom of the rack if it is the only unit in the rack.When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

Pay attention to the following guidelines before rack-mounting your appliance:

- Allow clearance around the rack for maintenance.

  If the rack contains stabilizing devices, install the stabilizers prior to mounting or servicing the appliance in the rack.
- When mounting an appliance in an enclosed rack, ensure adequate ventilation. Do not overcrowd an enclosed rack. Make sure that the rack is not congested, because each component generates heat.
- When mounting an appliance in an open rack, make sure that the rack frame does not block the intake or exhaust ports.
- If the rack contains only one appliance, mount the appliance at the bottom of the rack.
- If the rack is partially filled, load the rack from the bottom to the top, with the heaviest component at the bottom of the rack.

**Note** Use the rack mount brackets to mount the IPS 4345. Use the slide rail mounting system to mount the IPS 4360.

# Installing the IPS 4345 in a Rack

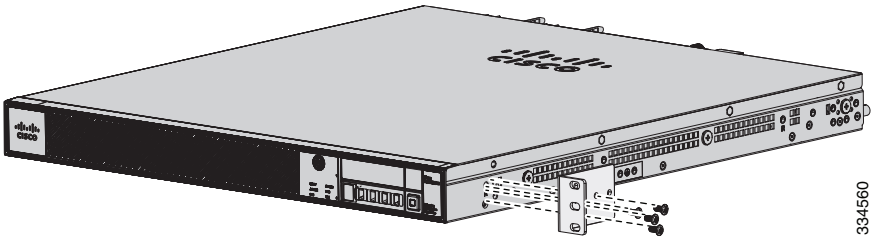
The IPS 4345 ships with the rack mount brackets installed on the front of the chassis. Use these brackets to mount the chassis to the front of the rack. If you want to mount the chassis on the back of the rack, you can move the brackets from the front to the back of the chassis.

To rack-mount the chassis, perform the following steps:

**Step 1** If you are keeping the front rack mount brackets, go to Step 4. If you want to move the front rack mount brackets to the back of the chassis, go to Step 2.

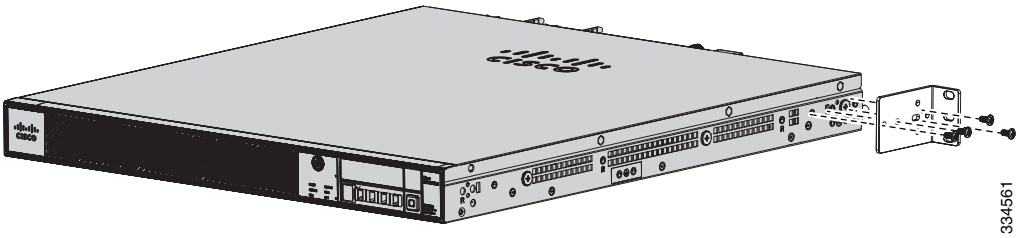
**Step 2** Remove the rack-mount brackets from the chassis as shown in Figure 4-8.

*Figure 4-8 Removing the Brackets from the Front of the Chassis*



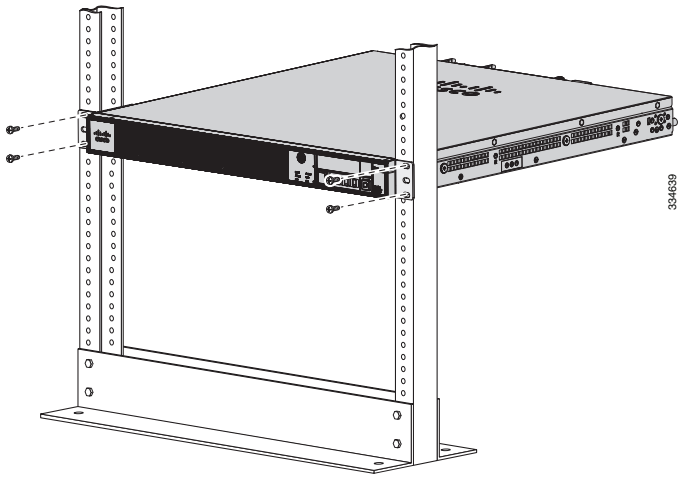

**Step 3** Install the brackets on the back of the chassis by attaching the brackets to the holes in the chassis as shown in Figure 4-9. After the brackets are secured to the chassis, you can rack-mount it.

*Figure 4-9 Installing the Brackets on the Back of the Chassis*



**Step 4** Attach the chassis to the rack using the supplied screws (Figure 4-10).

*Figure 4-10 Rack-Mounting the Chassis*




**Step 5** To remove the chassis from the rack, remove the screws that attach the chassis to the rack, and then remove the chassis.

# Mounting the IPS 4345 and IPS 4360 in a Rack with the Slide Rail Mounting System

The IPS 4360 ships with the slide rail mounting system, which provides a quick, convenient, and secure method for rack mounting the IPS 4360. You can also use the slide rail mounting system with the IPS 4345. For instructions for using the slide rail mounting system, refer to the *Slide Rail Installation Instructions for Cisco IronPort C170, M170, and S170 Appliances and Cisco 5512-X, 5515-X, 5525-X, 5545-X, 5555-X Adaptive Security Appliances and Cisco IPS 4345 and 4360* found at this URL:

http://www.cisco.com/en/US/docs/security/asa/hw/maintenance/5500xspares/slide_rail_installation.html

Although slide rail mounting is preferred for the IPS 4360, in the case of two-rail racks where the slide rails will not fit, you can use the rack mounting brackets. You must order them separately (ASA-BRACKETS=). Note that there will be a slight bend in the brackets when you attach them.

### For More Information

For the procedure for attaching the rack mounting brackets, see Installing the IPS 4345 in a Rack, page 4-10.

# Installing the Appliance on the Network

**Warning** **IMPORTANT SAFETY INSTRUCTIONS**

**This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071**

**SAVE THESE INSTRUCTIONS**

**Warning** **Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030**

To install the appliance on the network, follow these steps:

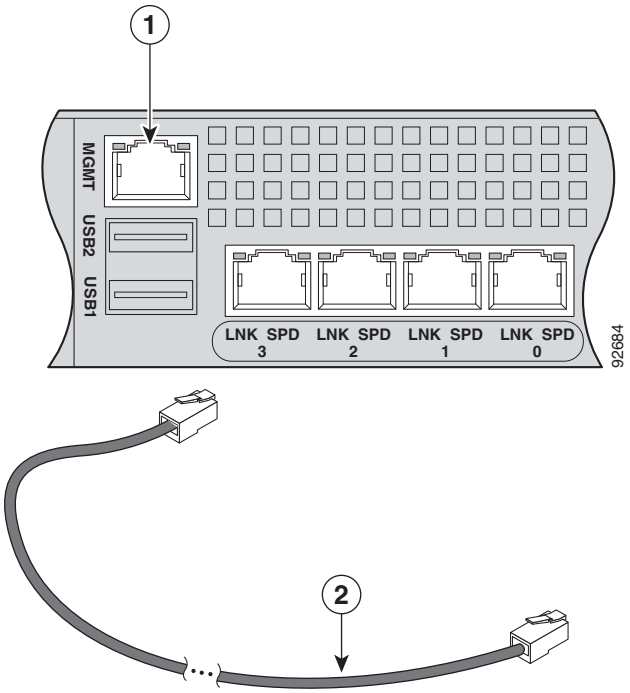
**Step 1** Position the appliance on the network.

**Step 2** Install the appliance in a rack, if you are rack mounting it.

**Step 3** Before connecting a computer or terminal to the ports, check to determine the baud rate of the serial port.

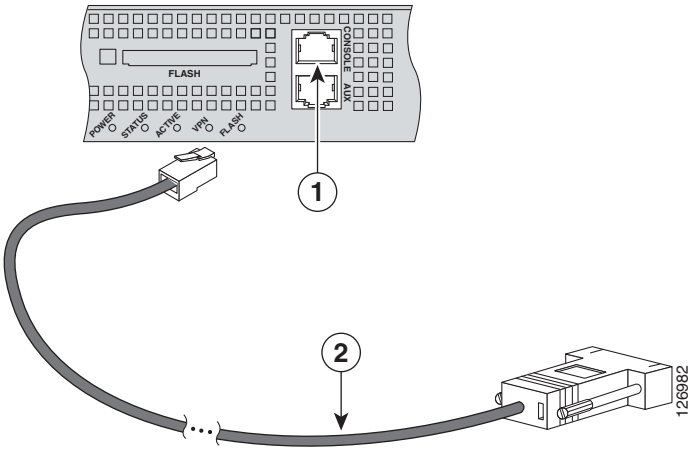
The baud rate must match the default baud rate (9600 baud) of the console port of the appliance. Set up the terminal as follows: 9600 baud (default), 8 data bits, no parity, 1 stop bits, and Flow Control (FC) = Hardware.

**Step 4** Connect to the management port. Connect one RJ-45 connector to the management port and connect the other end to the management port on your computer or network device. The appliance has a dedicated management interface referred to as Management 0/0, which is a GigabitEthernet interface with a dedicated port used only for traffic management.



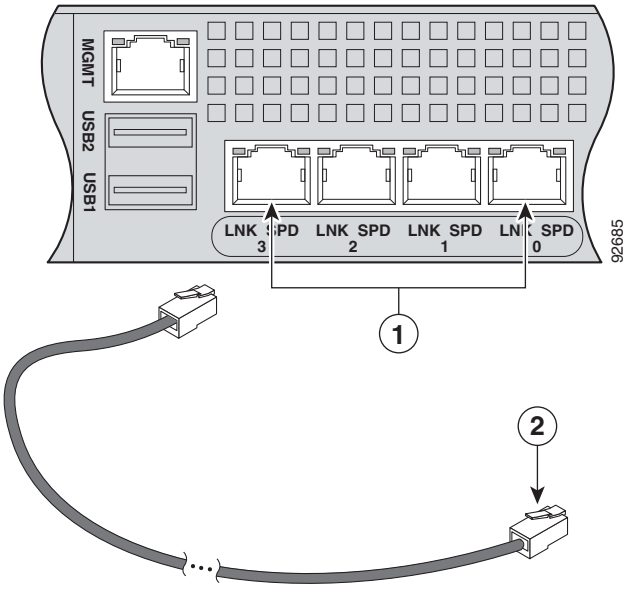

| | | | |
|---|---|---|---|
| **1** | Management 0/0 port | **2** | RJ-45 Ethernet cable |

**Step 5** Connect to the console port. The console cable has a DB-9 connector on one end for the serial port on your computer, and the other end is an RJ-45 connector. Connect the RJ-45 connector to the console port on the appliance, and connect the other end of the cable, the DB-9 connector, to the console port on your computer.




| | | | |
|---|---|---|---|
| **1** | RJ-45 console port | **2** | RJ-45 to DB-9 console cable |

**Step 6** Connect to the Ethernet ports. Connect the RJ-45 connector to the Ethernet port and connect the other end of the RJ-45 connector to your network device, such as a router, switch, or hub.




| | | | |
|---|---|---|---|
| **1** | RJ-45 Ethernet ports | **2** | RJ-45 connector |

**Step 7** Attach the power cable to the appliance and plug the other end in to a power source (a UPS is recommended).

**Step 8** Power on the appliance.

**Step 9** Initialize the appliance.

**Step 10** Install the most recent Cisco IPS software. You are now ready to configure intrusion prevention on the appliance.

---

**For More Information**

- For more information about ESD, see Preventing Electrostatic Discharge Damage, page 2-3.
- For the procedure for using the **setup** command to initialize the appliance, see Appendix B, "Initializing the Sensor."
- For the procedure for obtaining IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedures for configuring intrusion prevention on your sensor, refer to the following documents:
  - *Cisco Intrusion Prevention System Device Manager Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Manager Express Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Sensor CLI Configuration Guide for IPS 7.1*

# Removing and Installing the Power Supply

This section describes the AC and DC power supplies and how to install and remove them. It contains the following topics:


- AC Power Supply in V01 and V02 Chassis, page 4-15
- Understanding the Power Supplies, page 4-16
- Removing and Installing the AC Power Supply, page 4-18
- Installing DC Input Power, page 4-21
- Removing and Installing the DC Power Supply, page 4-26


## AC Power Supply in V01 and V02 Chassis

The Cisco IPS 4300 series sensors with the AC power supply can restore the previous power state of the system if AC power is lost. Earlier IPS 4300s (V01) require you to turn on the power with the power switch. Newer IPS 4300s (V02) automatically turn on when you plug in the power cable. To determine your version, do one of the following:

- At the CLI, enter the **show inventory** command and look for V01 or V02 in the output.
- On the back of the chassis, look at the VID PID label for V01 or V02.

The V01 chassis has the following limitations (these limitations do not apply to the V02 chassis):

- The sensor requires 50 seconds from the time that AC power is applied before the power state can be updated and stored. This means that any changes to the power state within the first 50 seconds of applying AC power will not be observed if AC power is removed within that time.

- The sensor requires 10 seconds from the time it is placed into standby mode before the power state can be updated and stored. This means any changes to the power state within the first 10 seconds of entering standby mode (including the standby mode itself) will not be observed if AC power is removed within that time.

# Understanding the Power Supplies

The IPS 4345 ships with one fixed fan and one fixed power supply (AC or DC) installed. The IPS 4360 ships with one power supply (AC or DC) installed. You can add an additional power supply or you can order the IPS 4360 with two power supplies installed. Having two power supplies installed provides a redundant power option. This configuration ensures that if one power supply fails, the other power supply assumes the full load until the failed power supply is replaced. To maintain airflow, an empty bay must be covered or both bays must be populated with power supplies. If only one power supply is installed, make sure that it is installed in slot 0 (left slot) and that slot 1 (right slot) is covered with a slot cover. If only one power supply is installed, do not remove the power supply unless the appliance has been powered off. Removing the only operational power supply causes an immediate power loss.

**Note** The IPS 4360 can support two AC or two DC power supplies. Do not mix AC and DC power supply units in the same chassis.

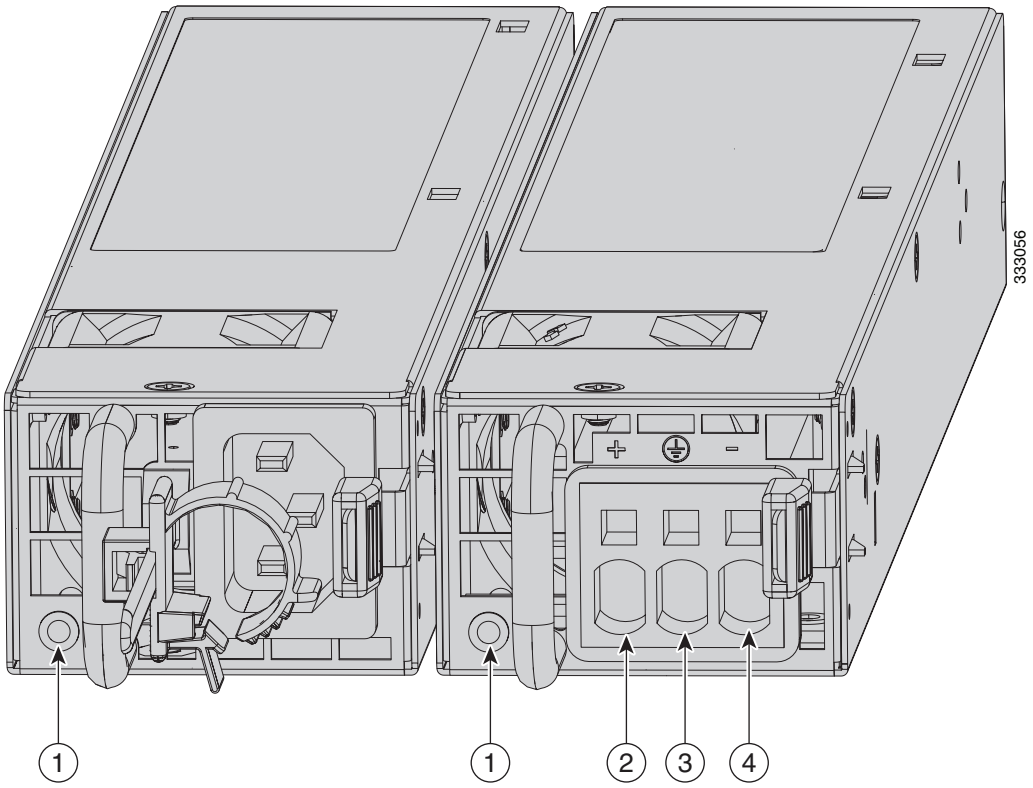
The power supplies each provide 400 W of output power and are used in a 1 + 1 redundant configuration. There is no input switch on the faceplate of the power supplies. The power supply is switched from Standby to ON by way of a system chassis STANDBY/ON switch. The power supply slot numbers are on the back of the chassis to the left side of each power supply. When facing the back of the chassis, power supply slot 0 (PS0) is to the left and power supply slot 1(PS1) is to the right. By default, the factory installs a single power supply in slot 0.

The appliance supports the following power supplies:

- AC power supply—Provides 400 watt output power with two DC voltage outputs: +12 V and +5 V. The AC power supply operates between 85 and 264 VAC. The AC power supply current shares on the 12 V output and is used in a dual hot pluggable configuration. The AC power supply consumes a maximum of 471 W of input power.
- DC power supply—Provides 400 watt output power with two DC voltage outputs: +12 V and +5.0 V. The power supply operates between –40.5 and –72 VDC. The DC power supply current shares on the 12 V output and is used in a dual hot pluggable configuration. The DC power supply consumes a maximum of 500 W of input power.

Figure 4-11 shows both the removable AC (on the left) and DC (on the right) power supplies for the IPS 4360.

*Figure 4-11 AC Power Supply and DC Power Supply*




| | | | |
|---|---|---|---|
| **1** | Power supply indicator | **2** | DC power supply positive connection |
| **3** | DC power supply neutral connection | **4** | DC power supply negative connection |

Table 4-4 describes the power supply indicator. The function of the indicator is the same for both the AC and DC power supplies.

*Table 4-4 AC and DC Power Supply Indicator*

| Indicator Color and State | Description |
|---|---|
| Solid green | Power output is on and within the normal operating range. |
| Blinking green, at the rate of one blink per second | Input power that is within the normal operating range is being supplied, but the Standby switch is in the Standby position (and not in the On position). |
| Solid amber | A power supply critical event has occurred, and the power supply has shut down. The critical event can be temperature, voltage, current, or fan operating outside the normal operating range. |

*Table 4-4 AC and DC Power Supply Indicator*

| Indicator Color and State | Description |
|---|---|
| Blinking amber, at the rate of one blink per second | A power supply warning event has occurred, but the power supply can continue to operate. The warning event can be temperature, voltage, current, or fan operating outside the normal operating range. |
| Off | The power supply is shut down. |

# Removing and Installing the AC Power Supply

**Caution** If you remove a power supply, replace it immediately to prevent disruption of service.

**Caution** If the appliance is subjected to environmental overheating, it shuts down and you must manually power cycle it to turn it on again.

**Warning** **This unit has more than one power supply connection; all connections must be removed completely to completely remove power from the unit.** Statement 102

**Warning** **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 120 VAC, 20A U.S. (240 VAC, 10A international). Statement 1005**

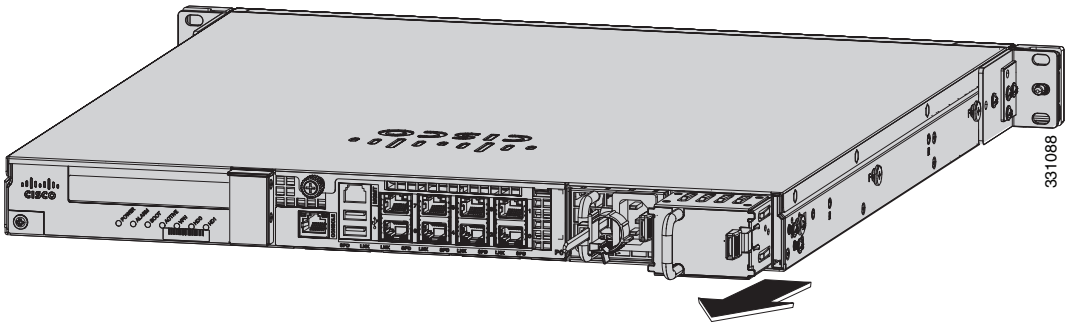
**Note** This procedure applies only to the appliances with a removable AC power supply (IPS 4360).

**Note** If only one power supply is installed, make sure that it is installed in slot 0 (left slot) and that slot 1 (right slot) is covered with a slot cover.

To remove and install the AC power supply, follow these steps:

**Step 1** If you are adding an additional power supply, from the back of the appliance, push the lever on the slot cover to the left to release it, grasp the handle of the slot cover and pull it away from the chassis (Figure 4-12). Save the slot cover for future use. Continue with Step 3.

***Figure 4-12 Removing the Slot Cover***



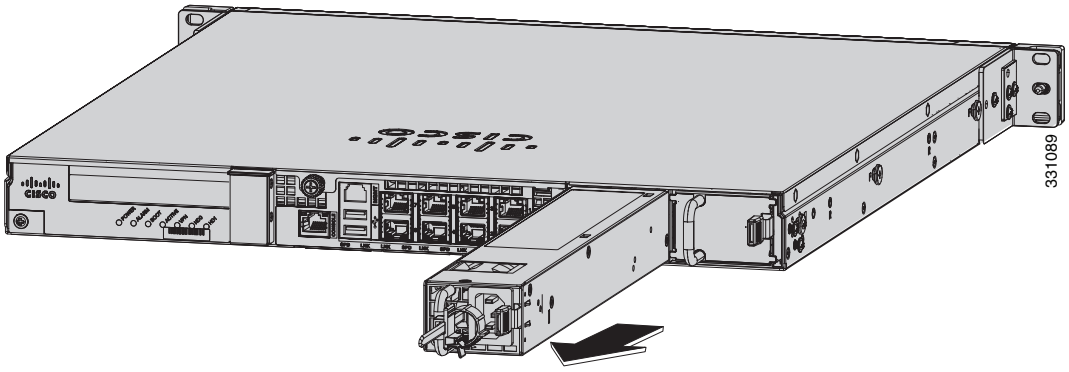

**Step 2** If you are replacing a power supply, follow these steps:

**a.** Power off the appliance.

**b.** From the back panel of the appliance, unplug the power supply cable.

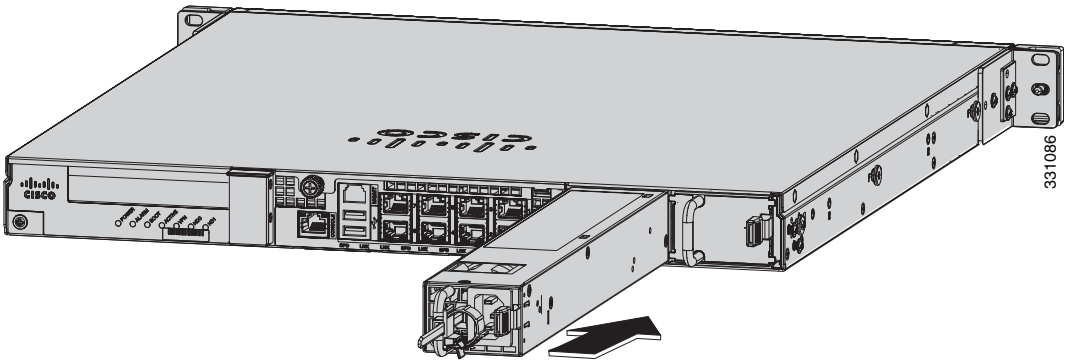
**c.** Push the lever on the power supply to the left and remove the power supply by grasping the handle and then pulling the power supply away from the chassis while supporting it from beneath with the other hand (Figure 4-13). Continue with Step 3.

***Figure 4-13 Removing the AC Power Supply***



**Step 3** Install the new power supply by aligning it with the power supply bay and pushing it into place until it is seated while supporting it from beneath with the other hand (Figure 4-14).

*Figure 4-14 Installing the AC Power Supply*

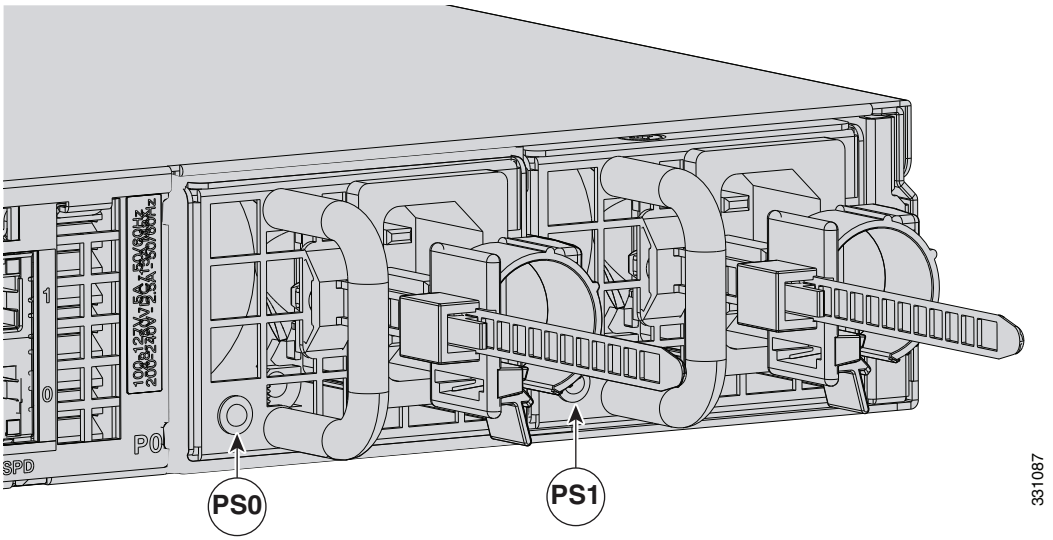



**Step 4** Connect the power cable. If you are installing two power supplies for a redundant configuration, plug each one into a power source (we recommend a UPS).

**Step 5** Power on the appliance if you powered it off to replace the only power supply.

**Step 6** Check the PS0 and PS1 indicators on the front panel to make sure they are green. On the back panel of the appliance, make sure the power supply indicator on the bottom of each installed power supply is green (Figure 4-15).

*Figure 4-15 Back Power Supply Indicators*



# Installing DC Input Power

**Warning** **The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed.** Statement 1077

**Warning** **When you install the unit, the ground connection must always be made first and disconnected last.** Statement 1046

**Warning** **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

**Warning** **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

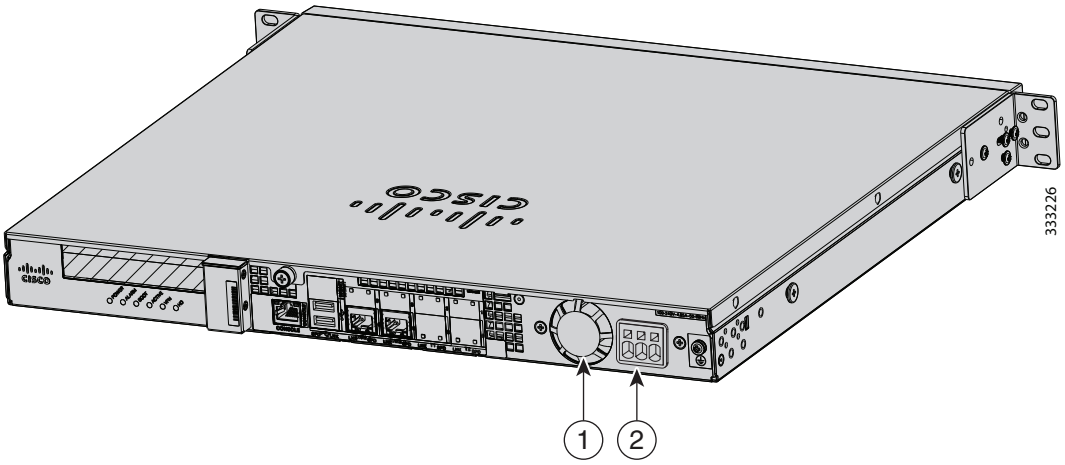
**Warning** **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 80 VAC, 20A.** Statement 1005

The DC power supply is shipped installed in the chassis, either one or two power supplies depending on which configuration you ordered. You must connect the power supply wires. This section describes how to install the DC power supply ground leads and input power leads to the appliance DC input power supply. Before you begin, read these important notices:

- The color coding of the DC input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground (GND), black is used for –48 V on the negative (–) terminal, and red is used for RTN on the positive (+) terminal. Ensure that the lead color coding you choose for the DC input power supply matches the lead color coding used at the DC power source.
- Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply. For more information, see Working in an ESD Environment, page 2-4.

Figure 4-16 shows the back panel of the IPS 4345 with the DC power supply.

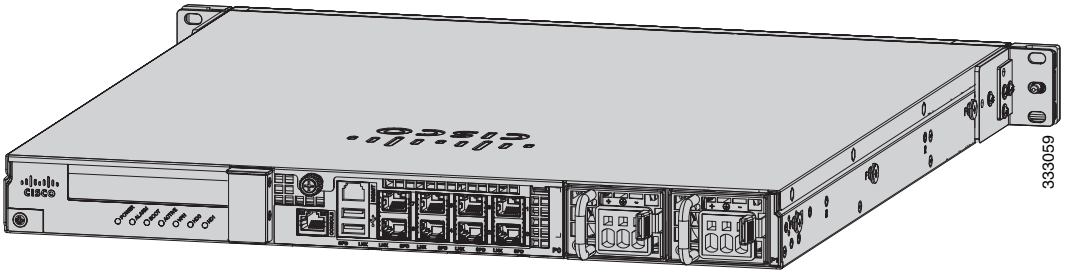
*Figure 4-16 IPS 4345 Back Panel*




| | | | |
|---|---|---|---|
| **1** | Fixed fan | **2** | Fixed DC power supply |

Figure 4-17 shows the back panel of the IPS 4360 with two DC power supplies.

*Figure 4-17 IPS 4360 Back Panel*




**Note** If only one power supply is installed, make sure that it is installed in slot 0 (left slot) and that slot 1 (right slot) is covered with a slot cover.

To connect the DC power supply on the appliance, follow these steps:

**Step 1** Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply.

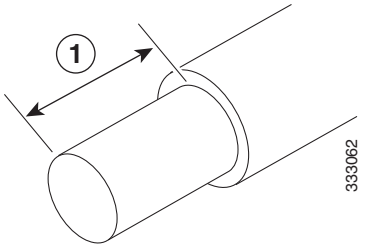
**Step 2** Turn off the circuit breaker to the power supply.

**Step 3** From the front of the appliance, verify that the power switch is in the Standby position.

**Step 4** Move the circuit-breaker switch handle to the Off position, and apply tape to hold it in the Off position.

**Step 5** Use a 10 gauge wire-stripping tool to strip each of the three wires coming from the DC input power source. Strip the wires to 0.27 inch (7 mm) ± 0.02 inch (0.5 mm). Do not strip more than the recommended length of wire because doing so could leave the wire exposed from the DC power supply connection (Figure 4-18).

***Figure 4-18 Stripping the DC Input Power Source Wire***



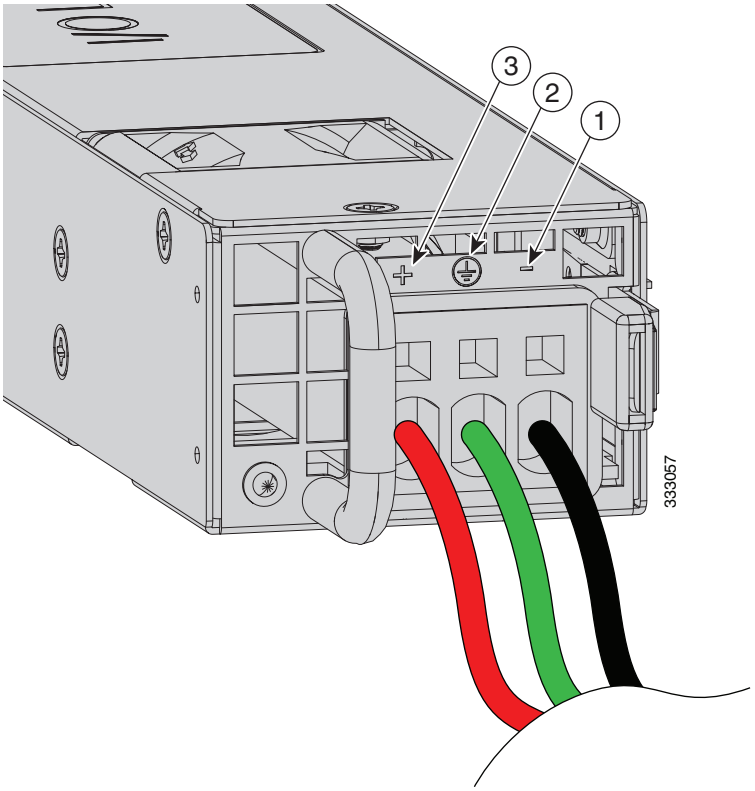

| | |
|---|---|
| **1** | We recommend that you strip the wire to 0.27 inch (7 mm). |

**Warning** **An exposed wire lead from a DC input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC input power source wire extends from the terminal block plug.** Statement 122

**Step 6** Identify the positive, negative, and ground feed positions for the DC power supply connection. The recommended wiring sequence is as follows (Figure 4-19):

- Ground lead wire (middle)
- Positive (+) lead wire (left)
- Negative (–) lead wire (right)

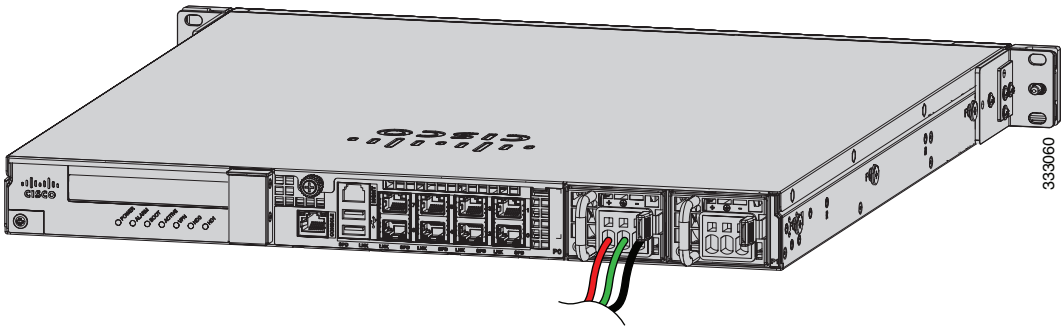
***Figure 4-19 Ground Wires***




| | | | |
|---|---|---|---|
| **1** | Negative (–) lead wire | **2** | Ground lead wire |
| **3** | Positive (+) lead wire | | |

Figure 4-20 shows the DC power supply with lead wires.

*Figure 4-20 DC Power Supply with Lead Wires*

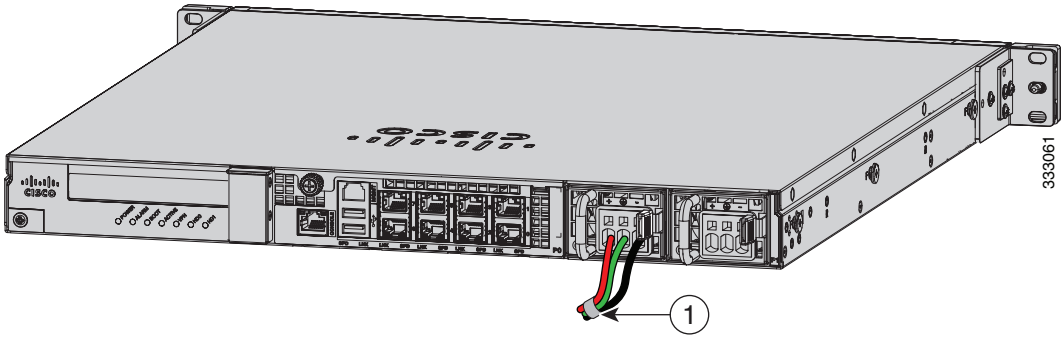



**Step 7** Insert the exposed end of one of the ground wires into the inlet on the DC power supply. After you push in the wires, they are held in place with a spring, which makes the physical contact. Make sure that you cannot see any wire lead. Only wires *with insulation* should extend from the DC power supply.

**Step 8** Repeat Step 5 through Step 7 for the remaining two DC input power source wires, the positive lead wire and the negative lead wire.

**Step 9** Use a tie wrap to secure the wires coming from the power supply to the rack so that the wires cannot be pulled from the power supply by casual contact. Make sure the tie wrap allows for some slack in the ground wire. Figure 4-21 shows the DC power supply with the wires inserted and the tie wrap secured.

*Figure 4-21 Complete DC Secure Tie Wrap*




| | | | |
|---|---|---|---|
| **1** | Lead wires secured with a tie wrap | | |

**Step 10** Remove the tape (if any) from the circuit breaker switch handle, and move the circuit breaker switch handle to the On position. The power supply indicators light up when power is supplied to the appliance.

# Removing and Installing the DC Power Supply

**Note** This procedure applies only to the appliances with a removable DC power supply (IPS 4360).

To remove and install a DC power supply, follow these steps:

**Step 1** Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply, as described in Working in an ESD Environment, page 2-4.

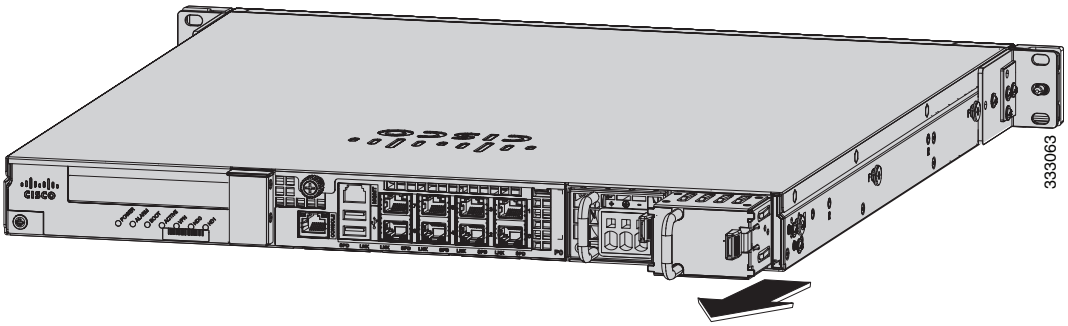
**Step 2** Turn off the circuit breaker to the power supply.

**Step 3** At the back of the appliance, place the Standby switch into the Standby position.

**Step 4** Move the circuit-breaker switch handle to the Off position, and apply tape to hold it in the Off position.

**Step 5** If you are adding an additional power supply, from the back of the appliance, push the lever on the slot cover to the left to release it, grasp the handle of the slot cover, and pull it away from the chassis (Figure 4-22). Save the slot cover for future use. Continue with Step 7.

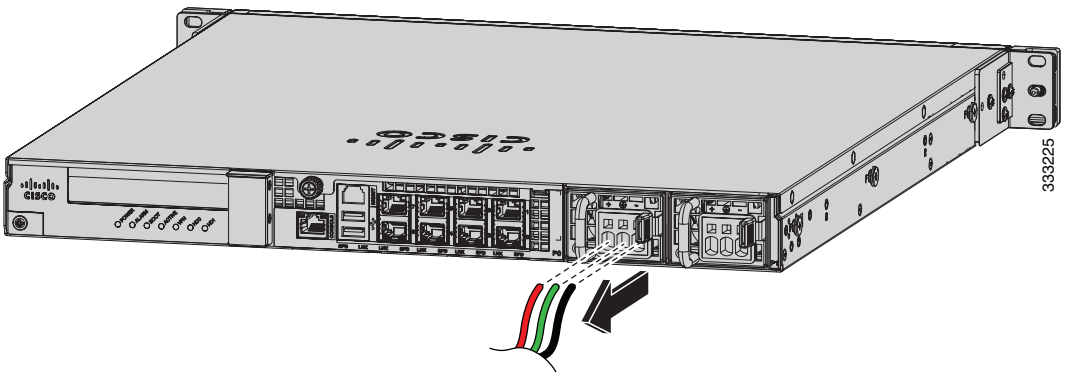
*Figure 4-22 Removing the Slot Cover*




**Step 6** If you are replacing a power supply, follow these steps:

**a.** Remove the wires from the DC power supply by inserting a small flat-head screwdriver into the square hole above the wire to relieve the spring pressure (Figure 4-23).

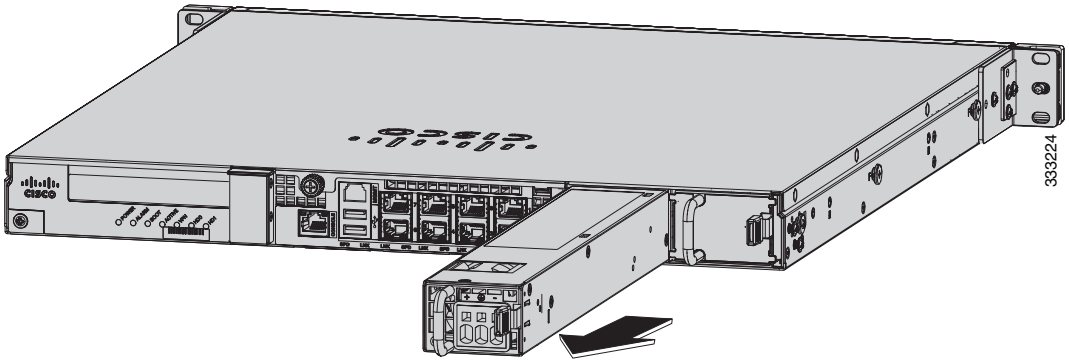
*Figure 4-23 Removing the Wires from the DC Power Supply*




**b.** Gently pull the wires out of the power supply.

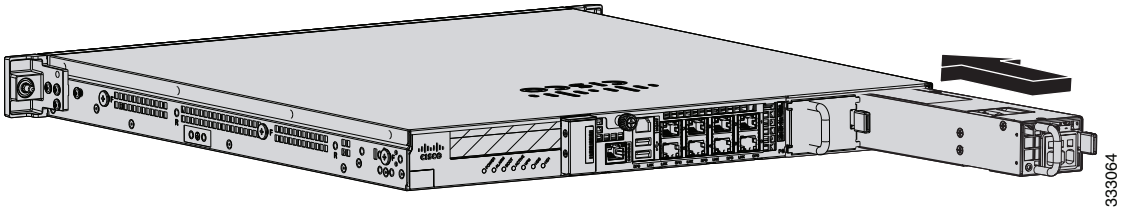
c. Push the lever on the power supply to the left and remove the power supply by grasping the handle and then pulling the power supply out of the chassis while supporting it from beneath with the other hand (Figure 4-24).

*Figure 4-24 Removing the DC Power Supply*




**Step 7** Install the new power supply by lining it up with the power supply bay and pushing it into place until it is seated while supporting it from beneath with the other hand (Figure 4-25).

*Figure 4-25 Installing the DC Power Supply*




**Step 8** To connect the DC input power source wires, see Step 5 though Step 10 in Installing DC Input Power, page 4-21.

# Installing the IPS 4510 and IPS 4520

## Contents

This chapter describes the Cisco IPS 4510 and IPS 4520, and includes the following sections:


- Installation Notes and Caveats, page 5-1
- Product Overview, page 5-2
- Chassis Features, page 5-3
- Specifications, page 5-9
- Accessories, page 5-10
- Memory Configurations, page 5-11
- Power Supply Module Requirements, page 5-11
- Supported SFP/SFP+ Modules, page 5-11
- Installing the IPS 4510 and IPS 4520, page 5-12
- Removing and Installing the Core IPS SSP, page 5-15
- Removing and Installing the Power Supply Module, page 5-17
- Removing and Installing the Fan Module, page 5-19
- Installing the Slide Rail Kit Hardware, page 5-20
- Installing and Removing the Slide Rail Kit, page 5-21
- Rack-Mounting the Chassis Using the Fixed Rack Mount, page 5-30
- Installing the Cable Management Brackets, page 5-33
- Troubleshooting Loose Connections, page 5-34
- IPS 4500 Series Sensors and the SwitchApp, page 5-35


## Installation Notes and Caveats

Pay attention to the following installation notes and caveats before installing the IPS 4510 and IPS 4520.

**Note** Read through the entire guide before beginning any of the installation procedures.

**Warning** **Only trained and qualified personnel should install, replace, or service this equipment.** Statement 49

**Caution** Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco Intrusion Prevention System 4500 Series Sensor Appliance* document and follow proper safety procedures when performing the steps in this guide.

# Product Overview

The IPS 4510 delivers 3Gbps of intrusion prevention performance based on real world deployment traffic patterns. You can use the IPS 4510 to protect multi-Gbps aggregated traffic traversing switches from multiple subnets and for medium sized data centers. The IPS 4510 is a purpose-built device that has support for both copper and fiber NIC environments thus providing flexibility of deployment in any environment. Based on the ASA 5585-X chassis, the IPS 4510 provides a proven hardware environment for stand-alone IPS protection. It ships with one power supply module, but optional redundant, hot-swappable power supply modules are available as well as hot-swappable fan modules in case of failures. All port numbers are numbered from right to left beginning with 0. This platform replaces the IPS 4270-20.

The IPS 4520 delivers 5 Gbps of intrusion prevention performance. You can use the IPS 4520 to protect multi-Gigabit networks and aggregated traffic traversing switches from multiple subnets. The IPS 4520 is a purpose-built device that has support for both copper and fiber NIC environments thus providing flexibility of deployment in any environment. The IPS 4520 ships with two power supply modules, but optional redundant, hot-swappable power supply modules are available as well as hot-swappable fan modules in case of failures. All port numbers are numbered from right to left beginning with 0. It is also based on the ASA 5585-X chassis.

Both the IPS 4510 and IPS 4520 have a console port, an auxiliary port, two 1 Gb (copper) management ports, and a total of 10 data ports—6 GigabitEthernet copper ports and 4 SFP/SFP+ module (1 or 10 Gb) ports.

**Note** The management ports are Management 0/0 and Management 0/1. Management 0/1 is reserved for future use.

**Note** Online insertion and removal (OIR) of the SFP/SFP+ module, power supply module, and fan module is supported.

**Caution** If you remove a power supply or fan module, replace it immediately to prevent disruption of service.

### IDM

The IPS 4510 and IPS 4520 support the Intrusion Prevention System Device Manager (IDM) 7.1.4 and later. IDM delivers security management and monitoring through an intuitive, easy-to-use web-based management interface. IDM is a Java Web Start application that enables you to configure and manage your IPS 4510 and IPS 4520. IDM is bundled with IPS 7.1. You can access it through Internet Explorer or Firefox web browsers.

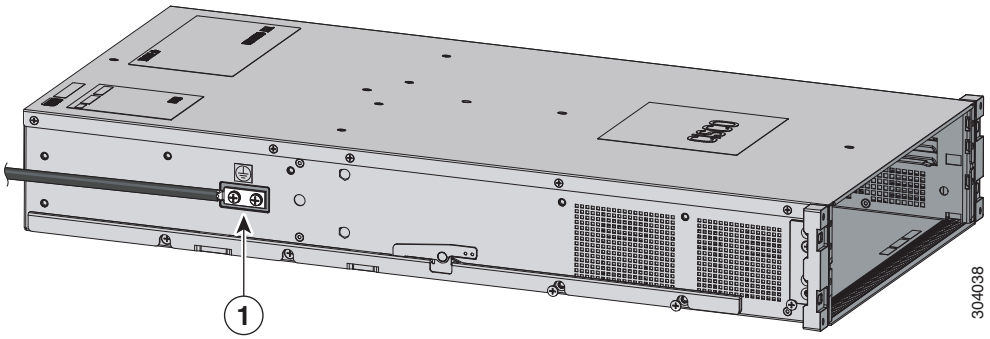
### IME

The Intrusion Prevention System Manager Express (IME) 7.2.3 and later also support the IPS 4510 and IPS 4520. IME is a network management application that provides system health, events, and collaboration monitoring in addition to reporting and configuration for up to ten sensors. IME monitors sensor health using customizable dashboards and provides security alerts through RSS feed integration from the Cisco Security Intelligence Operations site. It monitors global correlation data, which you can view in events and reports. It monitors events and lets you sort views by filtering, grouping, and colorization. IME also supports tools such, as ping, trace route, DNS lookup, and whois lookup for selected events. It contains a flexible reporting network. It embeds the IDM configuration component to allow for a seamless integration between the monitoring and configuration of IPS devices. Within IME you can set up your sensors, configure policies, monitor IPS events, and generate reports. IME works in single application mode—the entire application is installed on one system and you manage everything from that system.

# Chassis Features

This section describes the IPS 4510 and IPS 4520 chassis features and indicators. Figure 5-1 shows the grounding lug on the left side of the chassis (when facing the front of the chassis).

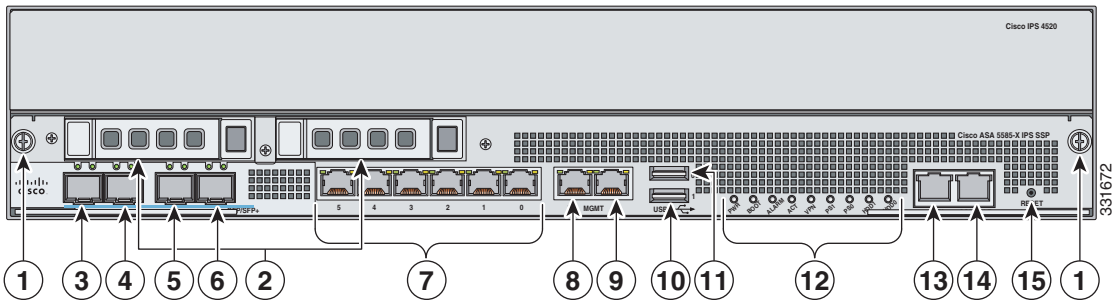
*Figure 5-1 IIPS 4510 and IPS 4520 Side Chassis View*




| | |
|---|---|
| 1 | Grounding lug |

Figure 5-2 shows the front view of the IPS 4510 and IPS 4520.

***Figure 5-2 IPS 4510 and IPS 4520 Front Panel Features***

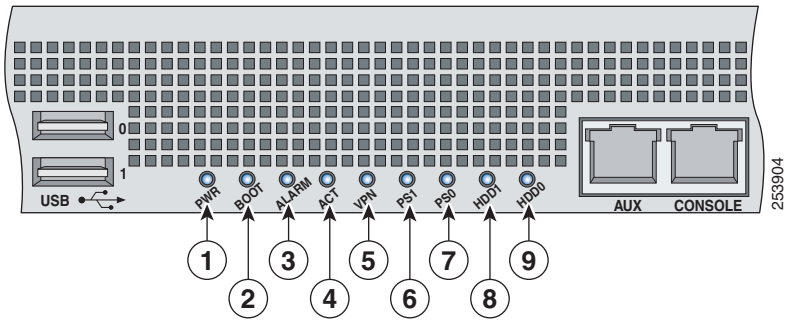



| | | | |
|---|---|---|---|
| **1** | Removal screws | **2** | Reserved bays for hard disk drives[1] |
| **3** | TenGigabitEthernet 0/9<br>(1-Gb and 10-Gb fiber SFP/SFP+ modules) | **4** | TenGigabitEthernet 0/8<br>(1-Gb and 10-Gb fiber SFP/SFP+ modules) |
| **5** | TenGigabitEthernet 0/7<br>(1-Gb and 10-Gb fiber SFP/SFP+ modules) | **6** | TenGigabitEthernet 0/6<br>(1-Gb and 10-Gb fiber SFP/SFP+ modules) |
| **7** | GigabitEthernet 0/0 through 0/5<br>(from right to left, 1-Gb copper RJ45) | **8** | Management 0/1[2]<br>(GigabitEthernet RJ45) |
| **9** | Management 0/0<br>(GigabitEthernet RJ45) | **10** | USB port |
| **11** | USB port | **12** | Front panel indicators |
| **13** | Auxiliary port (RJ45) | **14** | Console port (RJ45) |
| **15** | Reset[3] | | |

1. Hard disk drives are not supported at this time. The hard disk drive bays are empty.
2. Reserved for future use.
3. Reserved for future use.

Figure 5-3 shows the front panel indicators.

***Figure 5-3 Front Panel Indicators***




| | | | |
|---|---|---|---|
| **1** | PWR | **2** | BOOT |
| **3** | ALARM | **4** | ACT[1] |
| **5** | VPN[2] | **6** | PS1 |
| **7** | PS0 | **8** | HDD1[3] |
| **9** | HDD2[4] | | |

1. Not supported at this time.
2. Not supported at this time.
3. Not supported at this time.
4. Not supported at this time.

Table 5-1 describes the front panel indicators on the IPS 4510 and IPS 4520.

***Table 5-1 Front Panel Indicators***

| Indicator | Description |
|---|---|
| PWR | Indicates whether the system is off or on:<br>• Off—No power.<br>• Green—System has power. |
| BOOT | Indicates how the power-up diagnostics are proceeding:<br>• Flashing green—Power-up diagnostics are running or the system is booting.<br>• Green—System has passed power-up diagnostics.<br>• Amber—Power-up diagnostics failed. |
| ALARM | Indicates whether a component has failed:<br>• Off—No alarm.<br>• Flashing yellow—Critical alarm.<br>Major failure of hardware component or software module, temperature over the limit, power out of tolerance, or OIR is ready to remove the module.[1] |
| ACT | Not supported at this time. |
| VPN | Not supported at this time. |

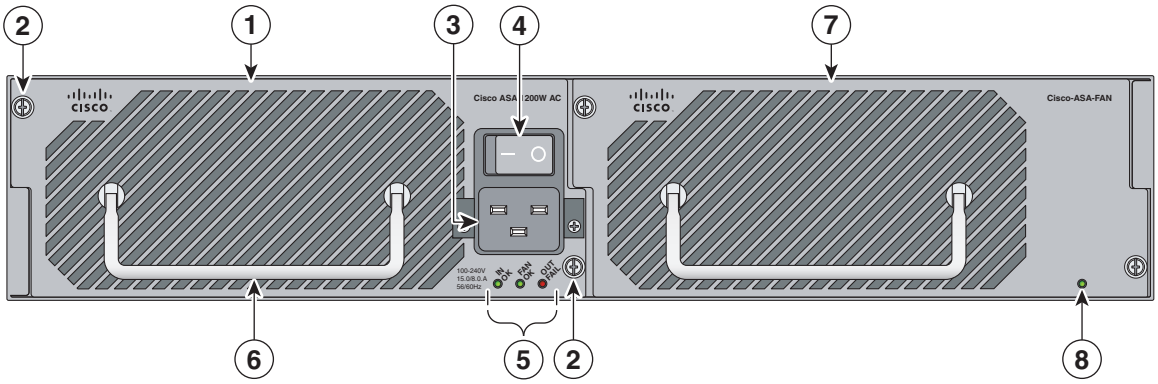
*Table 5-1 Front Panel Indicators (continued)*

| Indicator | Description |
|---|---|
| PS1 | Indicates the state of the power supply module installed on the right when facing the back panel:<br>• Off—No power supply module present or no AC input.<br>• Green—Power supply module present, on, and good.<br>• Amber—Power or fan module off or failed. |
| PS0 | Indicates the state of the power module installed on the left when facing the back panel:<br>• Off—No power supply module present or no AC input.<br>• Green—Power supply module present, on, and good.<br>• Amber—Power or fan module off or failed. |
| HDD1[2] | Indicates activity on the hard disk drive:<br>• Off—No hard disk drive present.<br>• Flashing green—Hard disk drive activity.<br>• Amber—Hard disk drive failure. |
| HDD2[3] | Indicates activity on the hard disk drive:<br>• Off—No hard disk drive present.<br>• Flashing green—Hard disk drive activity.<br>• Amber—Hard disk drive failure. |

1. OIR is not available at this time.
2. The hard disk drive bays are reserved for future use.
3. The hard disk drive bays are reserved for future use.

Figure 5-4 shows the back panel features.

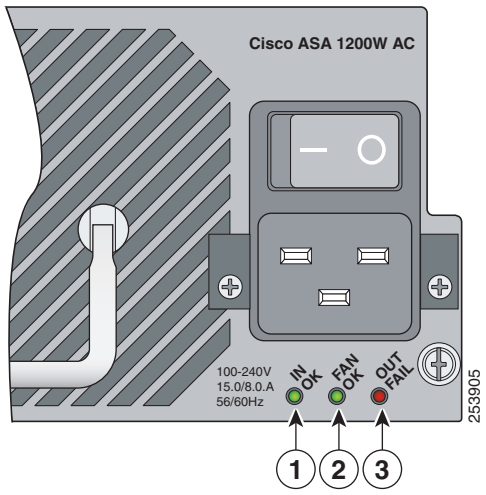
***Figure 5-4 Back Panel Features***




| | | | |
|---|---|---|---|
| **1** | Power supply module (corresponds to PS1 indicator) | **2** | Power supply module/fan module removal screws |
| **3** | Power supply module plug | **4** | Toggle On/Off switch for power supply module |
| **5** | Power supply module indicators | **6** | Power supply module or fan module handle |
| **7** | Fan module | **8** | Fan module indicator |

Figure 5-5 shows the power supply module indicators.

***Figure 5-5 Power Supply Module Indicators***




| | | | |
|---|---|---|---|
| **1** | IN OK | **2** | FAN OK |
| **3** | OUT FAIL | | |

Table 5-2 describes the power supply module and fan module indicators.

*Table 5-2 Power Supply Module and Fan Module Indicators*

| Indicator | Description |
|---|---|
| IN OK | Indicates status of power supply module:<br>• Off—No AC power cord connected or AC power switch off.<br>• Green—AC power cord connected and AC power switch on. |
| FAN OK | Indicates status of fan module<br>• Off—Fan module failure or AC power switch off.<br>• Green—AC power cord connected, AC power switch on, and internal fan is running. |
| OUT FAIL | • Red—Output voltage failure[1] |

1. The power supply module has three output voltages—3.3V, 12V, and 50V.

Table 5-3 describes the Ethernet port indicators.

*Table 5-3 Ethernet Port Indicators*

| Indicator | Description |
|---|---|
| Gigabit Ethernet (RJ45) | • Left side:<br>– Green—Physical activity<br>– Flashing green—Network activity<br>• Right side:<br>– Not lit—10 Mbps<br>– Green—100 Mbps<br>– Amber—1000 Mbps |

*Table 5-3 Ethernet Port Indicators (continued)*

| Indicator | Description |
|---|---|
| 10-Gigabit Ethernet Fiber (SFP+)/1-Gigabit Ethernet Fiber (SFP) | • Left side:<br>– Off—No 10-Gigabit Ethernet physical link<br>– Green—10-Gigabit Ethernet physical link<br>– Flashing green[1]—Network activity<br>• Right side:<br>– Off—No 1-Gigabit Ethernet physical link<br>– Green—1-Gigabit Ethernet physical link<br>– Flashing green[1]—Network activity |
| Management port | • Left side:<br>– Green—Physical activity<br>– Flashing green—Network activity<br>• Right side:<br>– Not lit—10 Mbps<br>– Green—100 Mbps<br>– Amber—1000 Mbps |

1. Flashing is in proportion to the percentage of number of packets or bytes received.

# Specifications

Table 5-4 lists the specifications for the IPS 4510 and IPS 4520.

*Table 5-4 IPS 4510 and IPS 4520 Specifications*

| **Dimensions and Weight** | |
|---|---|
| Height | 3.47 in (8.8 cm) |
| Width | 19 in (48.3 cm) |
| Depth | 26.5 in (67.3 cm) |
| Weight | 50 lb (22.7 kg) |
| Form factor | 2 RU, standard 19-inch rack-mountable |
| **Power** | |
| Rated input voltage (per power supply module) | 100 to 127 VAC<br>200 to 240 VAC |
| Rated input frequency | 50 to 60 Hz |
| Rated input power | 1465W @ 100 VAC<br>1465W @ 200 VAC |
| Rated input current | 12A (100 VAC)<br>8A (200 VAC) |

*Table 5-4 IPS 4510 and IPS 4520 Specifications (continued)*

| | |
|---|---|
| Maximum heat dissipation | 3960 BTU/hr (100 VAC)<br>5450 BTU/hr (200 VAC) |
| Power supply output steady state<br><br>Maximum peak | 1200W<br><br>1200W |
| **Environment** | |
| Temperature | Operating 32°F to 104°F (0°C to 40°C)<br>Nonoperating -40°F to 158°F (-40°C to 70°C) |
| Airflow | Front to back |
| Relative humidity (noncondensing) | Operating 10% to 90%<br>Nonoperating 5% to 95% |
| Altitude | Operating 0 to 3000 ft (9843 ft)<br>Nonoperating 0 to 4570 ft (15,000 ft) |
| Shock | Operating Half-sine 2 G, 11 ms pulse, 100 pulses<br>Nonoperating 15 G, 170 in/sec delta V |
| Vibration | 2.2 Grms, 10 minutes per axis on all three axes |
| Noise | 65 dBa max |

# Accessories

The contents of the sensor packing box contains the following items you need to install the sensor:

- Sensor chassis
- Documentation
- 2 Yellow Ethernet cables
- Blue console cable PC terminal adapter
- Power cable 120V

**Note** The IPS 4510 ships with one power supply module installed and one power cable. The IPS 4520, ships with two power supply modules installed and two power cables.

- Screws
- Cable management brackets
- Front and rear rack-mount brackets
- Slide rail kit hardware
- Slide rail kit

# Memory Configurations

The IPS 4510 and IPS 4520 have up to 6 DIMM modules per CPU. DIMM population is platform-dependent. Table 5-5 shows the memory configurations.

*Table 5-5 Memory Configurations*

| Model | Memory |
|---|---|
| IPS 4510 | 24-GB DRAM |
| IPS 4520 | 48-GB DRAM |

# Power Supply Module Requirements

Table 5-6 lists the power supply module requirements.

*Table 5-6 Power Supply Module Requirements*

| | 50 V | 12 V | 3.3 V_STBY |
|---|---|---|---|
| **Output Voltage** | | | |
| Maximum | 52.0 V | 12.2. V | 3.45 V |
| Nominal | 50.0 V | 12.0 V | 3.35 V |
| Minimum | 48.0 V | 11.8 V | 3.25 V |
| **Output Current @ 200 VAC** | | | |
| Maximum | 17.3 A | 27.0 A | 1.5 A |
| Minimum | 0 | 0 | 0 |
| **Output Current @ 100 VAC** | | | |
| Maximum | 17.3 A | 27.0 A | 1.5 A |
| Minimum | 0 | 0 | 0 |

**Note** The IPS 4520 requires two power supply modules.

# Supported SFP/SFP+ Modules

The SFP/SFP+ module is a hot-swappable input/output device that plugs into the SFP/SFP+ ports and provides Gigabit Ethernet connectivity. The SFP and SFP+ modules are optional and not included with the IPS 4510 and IPS 4520. You can purchase them separately. For 1 Gb, you need SFP. For 10Gb, you need SFP+. The interfaces are called TenGigabitEthernet 0/*x* whether they are 10 Gb-enabled or not.

Table 5-7 lists the SFP/SFP+ modules that the IPS 4510 and IPS 4520 support.

*Table 5-7 SFP/SFP+ Modules*

| | |
|---|---|
| **1G SFP Module** | |
| GLC-SX-MM | 1000 Base-SX SFP module |
| GLC-SX-MMD | 1000BASE-SX short wavelength, with DOM |
| GLC-LH-SM | 1000 Base-LX/LH SFP module |
| GLC-LH-SMD | 1000BASE-LX/LH long-wavelength, with DOM |
| GLC-T | 1000BASE-T standard |
| **10G SFP+ Module** | |
| SFP-10G-ER | 10G ER SFP+ module |
| SFP-10G-SR | 10G SR SFP+ module |
| SFP-10G-LRM | 10G LRM SFP+ module |
| SFP-10G-LR | 10G LR SFP+ module |
| SFP-H10GB-ACU7M | 10GBASE-CU SFP+ Cable 7 Meter, active |
| SFP-H10GB-ACU10M | 10GBASE-CU SFP+ Cable 10 Meter, active |
| SFP-H10GB-CU1M | 10GBASE-CU SFP+ cable 1 meter, passive |
| SFP-H10GB-CU3M | 10GBASE-CU SFP+ cable 3 meter, passive |
| SFP-H10GB-CU5M | 10GBASE-CU SFP+ cable 5 meter, passive |

# Installing the IPS 4510 and IPS 4520

The IPS 4510 and IPS 4520 have two dedicated Gigabit Ethernet interfaces for device management that are called Management 0/0 and Management 0/1. The additional interface, Management 0/1 is reserved for future use. The management interfaces are similar to the console port, because they only accept traffic that is destined to-the-box (versus traffic that is through-the-box).

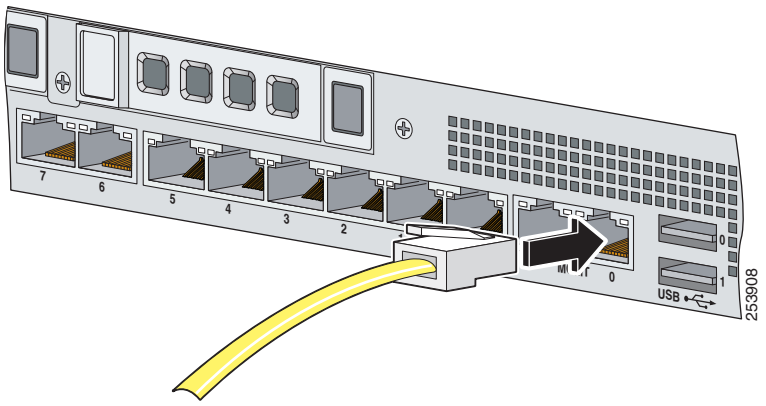
To connect the IPS 4510 and IPS 4520 cables to the network interfaces, follow these steps:

**Step 1** Place the sensor on a flat, stable surface, or in a rack (if you are rack-mounting it).

**Step 2** Connect to the management interface, Management 0/0.

**a.** Locate an Ethernet cable, which has an RJ-45 connector on each end.

**b.** Connect one RJ-45 connector to the Management 0/0 interface.




**c.** Connect the other end of the Ethernet cable to the Ethernet port on your computer or to your management network.

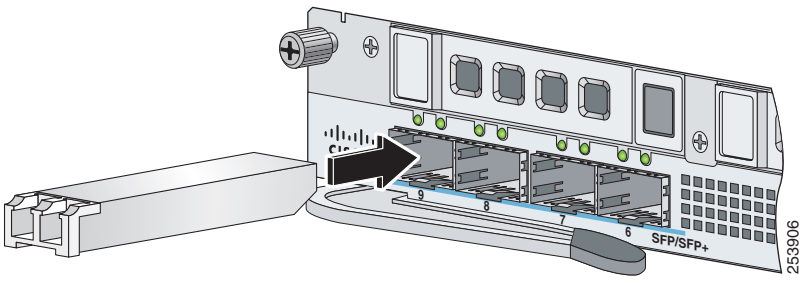
**Caution** Management and console ports are privileged administrative ports. Connecting them to an untrusted network can create security concerns.

**Step 3** (Optional) Connect to the sensor console port if you want to use the IPS CLI. Use the console port to connect to a computer to enter configuration commands.

**a.** Before connecting a computer or terminal to any ports, determine the baud rate of the serial port. The baud rate of the computer or terminal must match the default baud rate (9600 baud) of the console port of the adaptive security appliance. Set up the terminal as follows: 9600 baud (default), 8 data bits, no parity, 1 stop bits, and Flow Control (FC) = Hardware.

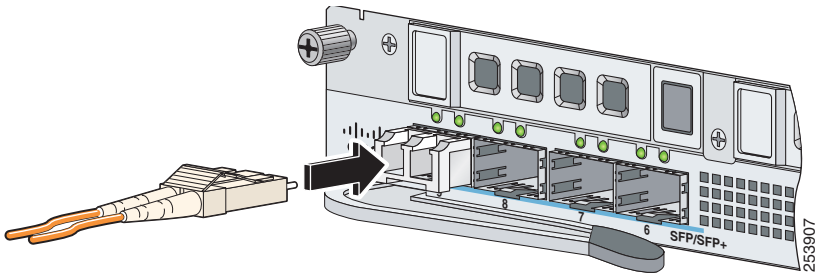
**b.** Connect the RJ-45 to the console port and connect the other end to your computer.

**Step 4** (Optional) Connect to the SFP/SFP+ port if you are using fiber ports. The IPS 4510 and the IPS 4520 have four SFP/SFP+ ports. If you are using the fiber ports, you need an SFP+ module for 10-Gigabit Ethernet or an SFP module for 1-Gigabit Ethernet (SFP or SFP+ modules are not included).




**a.** Install the SFP/SFP+ module.

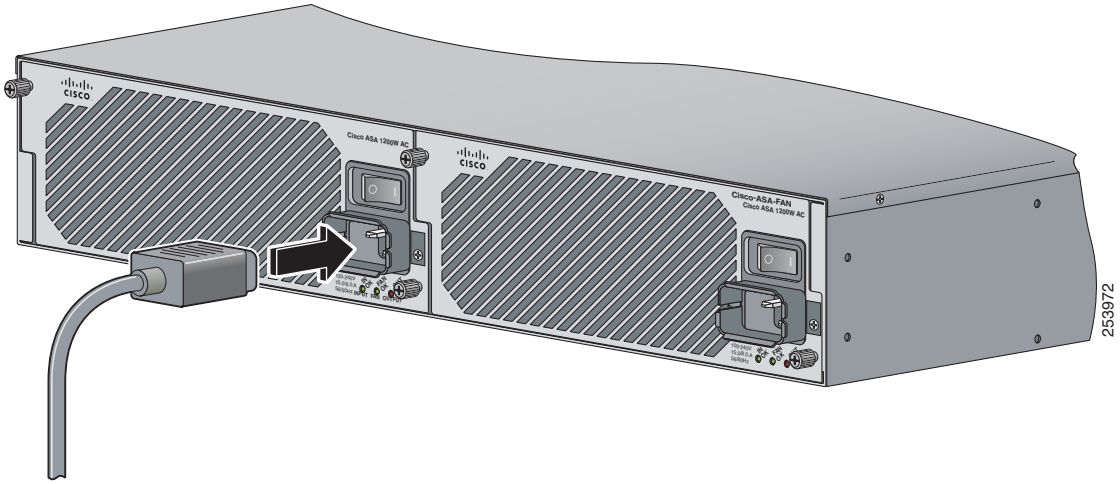
**b.** Connect one end of the LC cable to the SFP/SFP+ module.



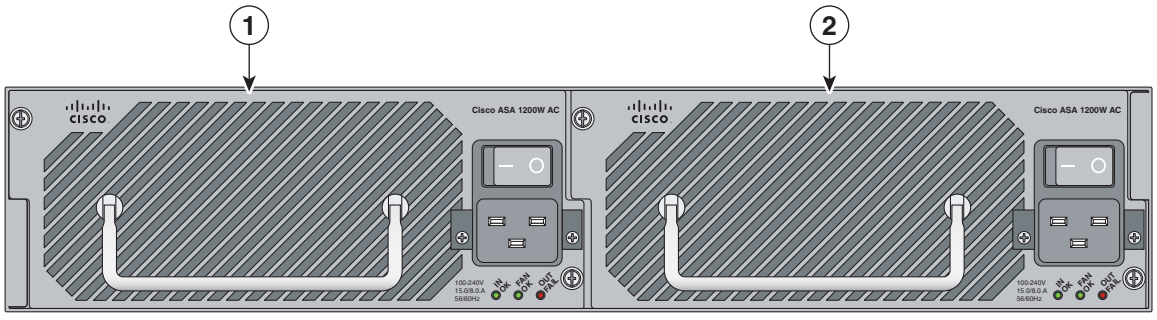

**c.** Connect the other end of the LC cable to a network device, such as a router or switch.

**Step 5** Install the electrical cables.

**a.** Attach the power cable to the power supply module on the back of the sensor.




**b.** If you have redundant power supply modules, you must connect both power cables to the back of the sensor.




| | | | |
|---|---|---|---|
| **1** | Power supply module (PS0) | **2** | Power supply module (PS1) |

**c.** Plug the power cable(s) in to a power source (we recommend a UPS).

**Step 6** Power on the sensor.

**Caution** If the appliance is subjected to environmental overheating, it shuts down and you must manually power cycle it to turn it on again.

**Step 7** Check the PWR indicator on the front panel of the sensor to verify power socket connectivity. It should be green. To verify power supply operation, check the PS0 and PS1 indicators on the front panel. They should be green. On the back panel of the sensor, make sure the IN OK and the FAN OK indicators are green and the OUT FAIL indicator is off.

#### For More Information

For a list of the supported SFP/SFP+ modules, see Supported SFP/SFP+ Modules, page 5-11.

# Removing and Installing the Core IPS SSP

You can uninstall the core IPS SSP in the IPS 4510 and IPS 4520, for example, if you need to move it to a different chassis or replace it.

To remove and install the core IPS SSP in the IPS 4510 and IPS 4520, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Prepare the sensor to be powered off. Wait for the power down message before continuing with Step 3.

```
sensor# reset powerdown
```

**Note** You can also power off the sensor using the IDM or the IME.

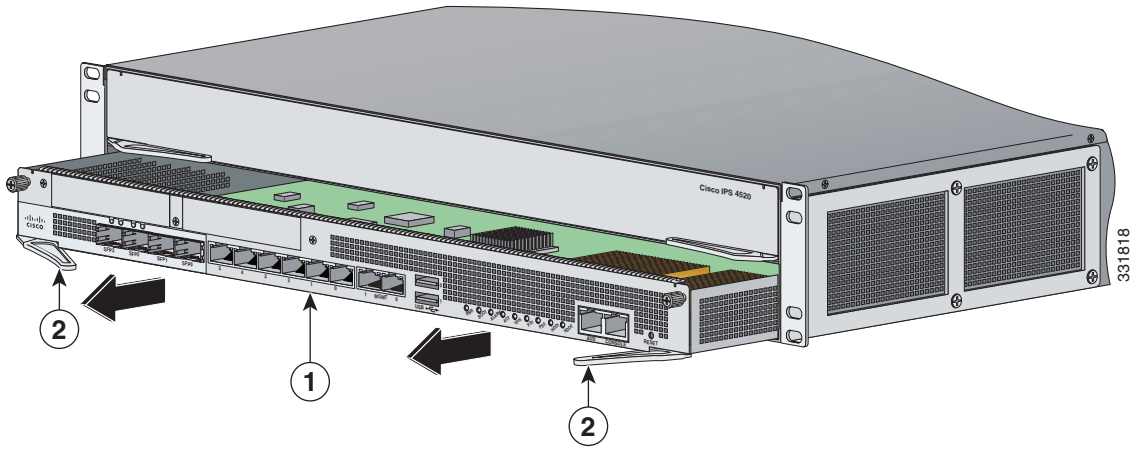
**Step 3** Press **Enter** to confirm.

**Step 4** Power off the sensor.

**Step 5** Remove the power cable from the sensor.

**Step 6** From the front panel of the sensor, loosen the captive screws from the bottom slot.

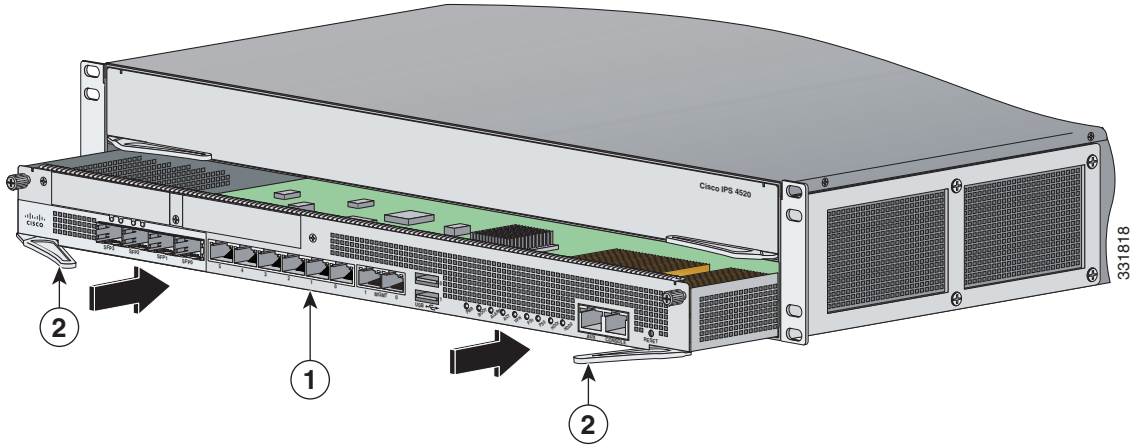
**Step 7** Grasp the ejection levers at the left and right bottom of the designated slot and pull them out.




| | | | |
|---|---|---|---|
| **1** | Module | **2** | Ejection levers |

**Step 8** Grasp the sides of the module and pull it all the way out of the chassis.

**Step 9** Install the new module by lining it up with the module slot making sure the ejection levers are extended.




| | | | |
|---|---|---|---|
| **1** | Module | **2** | Ejection levers |

**Step 10** Slide the module into the slot until it is seated and push the ejection levers back into place.

**Step 11** Tighten the screws.

**Step 12** Reconnect the power cable to the sensor.

**Step 13** Power on the sensor.

**Step 14** Verify that the PWR indicator on the front panel is green.

# Removing and Installing the Power Supply Module

The IPS 4510 ships with one power supply module and one fan module installed, and the IPS 4520 ships with two power supply modules installed in a load balancing/sharing configuration. This configuration ensures that if one power supply module fails, the other power supply module assumes the full load until the failed power supply module is replaced. To maintain airflow, both bays must be populated by either a power supply module and a fan module or two power supply modules.

You can replace the fan module with a second power supply module in the IPS 4520 to create a redundant power supply module configuration. If you already have two power supply modules installed, you can install or replace either power supply module without powering off the sensor, as long as one power supply module is active and functioning correctly.

If only one power supply module is installed, do not remove the power supply module unless the sensor has been powered off. Removing the only operational power supply module causes an immediate power loss.

**Caution** If you remove a power supply or fan module, replace it immediately to prevent disruption of service.

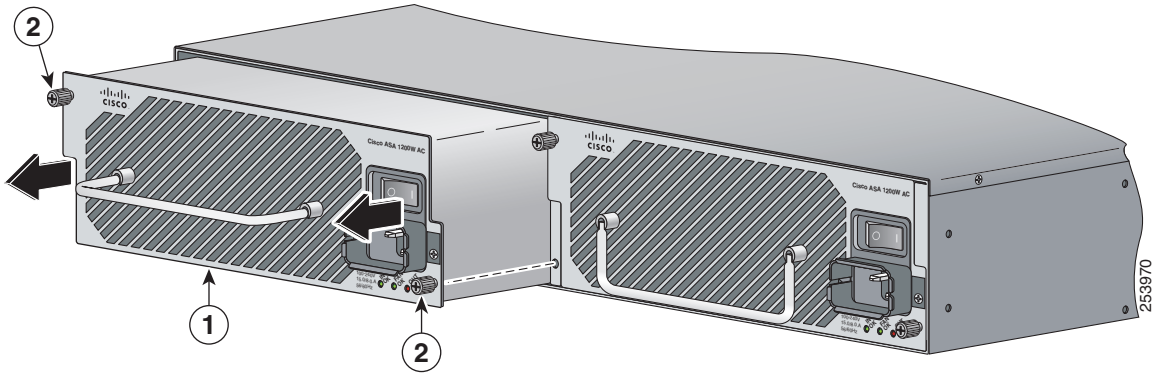
**Caution** If the appliance is subjected to environmental overheating, it shuts down and you must manually power cycle it to turn it on again.

To remove and install the power supply module, follow these steps:

**Step 1** If you are removing the only power supply module, power off the sensor.

**Step 2** From the back panel of the sensor, unplug the power supply module cable.

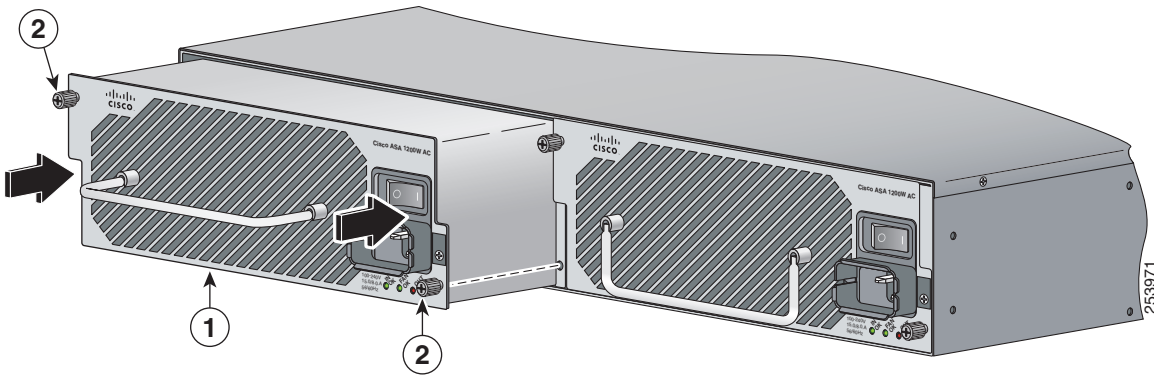
**Step 3** On the back of the sensor, loosen the captive screws from the power supply module.




| | | | |
|---|---|---|---|
| 1 | Power supply module and power supply module handle | 2 | Power supply module screws |

**Step 4** Remove the power supply module by grasping the handle and pulling the power supply module away from the chassis.

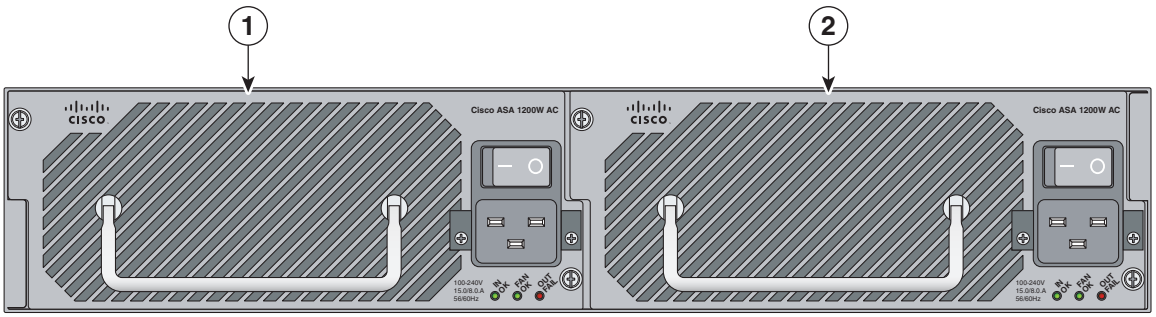
**Step 5** Install the new power supply module by aligning it with the power supply module bay and pushing it into place until it is seated.




| | | | |
|---|---|---|---|
| **1** | Power supply module and power supply module handle | **2** | Power supply module screws |

**Step 6** Tighten the captive screws.

**Step 7** Reconnect the power cable. If you are installing two power supply modules for a redundant configuration, plug each one into a power source (we recommend a UPS).




| | | | |
|---|---|---|---|
| **1** | Power supply module (PS0) | 2 | Power supply module (PS1) |

**Step 8** If you had to power off the sensor because you are removing and replacing the only power supply module, power it back on.

**Step 9** Check the PS0 and PS1 indicators on the front panel to make sure they are green. On the back panel of the sensor, make sure the IN OK and the FAN OK indicators are green and the OUT FAIL indicator is off.

# Removing and Installing the Fan Module

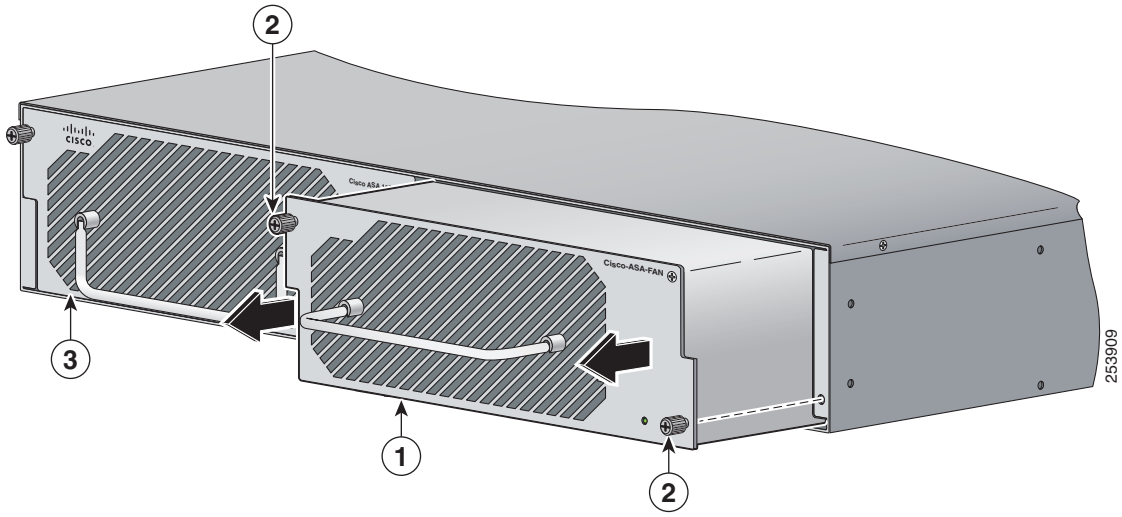
The IPS 4510 ships with one power supply module and one fan module installed, and the IPS 4520 ships with two power supply modules instead of a power supply module and a fan module. You can replace the fan module in the IPS 4510 if necessary. The fan module is hot-pluggable. You can install or replace the fan module without powering down the sensor, as long as the power supply module is active and functioning correctly. To maintain airflow, both bays must be populated by either a power supply module and a fan module or two power supply modules.

**Note** A power supply module is required for the system to operate.

**Caution** If you remove a power supply or fan module, replace it immediately to prevent disruption of service.

To remove and install the fan module, follow these steps:

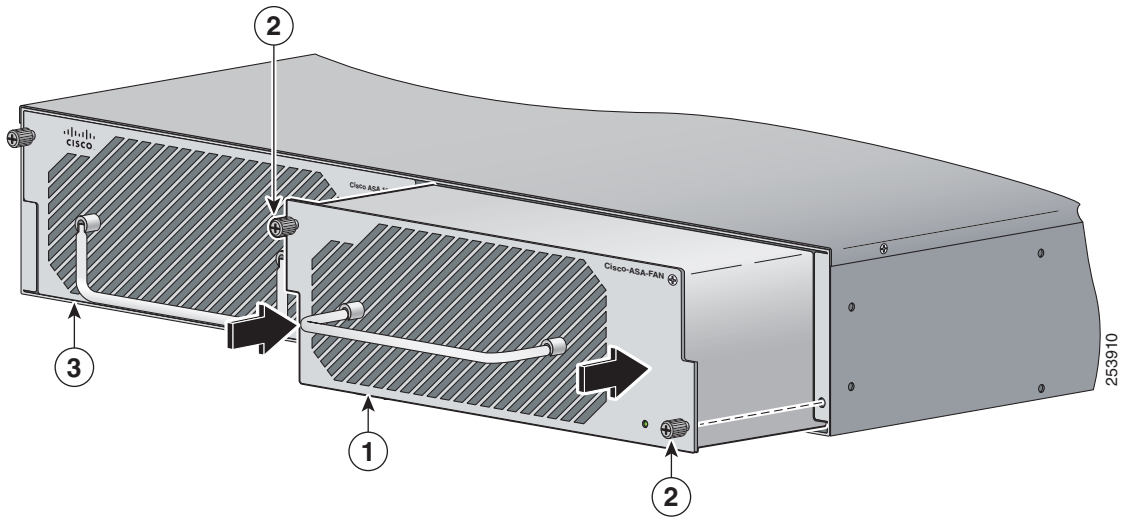
**Step 1** From the right-hand side of the back panel of the sensor loosen the fan module screws until they release. The screws are captive in the front panel.




| | | | |
|---|---|---|---|
| **1** | Fan module and fan module handle | **2** | Fan module screws |
| **3** | Power supply module | | |

**Step 2** Remove the fan module by grasping the handle and pulling the fan module away from the chassis.

**Step 3** Install the new fan module by aligning it with the fan module bay and pushing it into place until it is seated.




| | | | |
|---|---|---|---|
| **1** | Fan module and fan handle | **2** | Fan module screw |
| **3** | Power supply module | | |

**Step 4** Tighten the captive screws.

**Step 5** Verify that the fan indicator on the lower right-hand of the back panel is green.

# Installing the Slide Rail Kit Hardware

Before installing the appliance in the slide rail kit, you must install the slide rail kit hardware.

To install the slide rail kit hardware on the IPS 4510 and IPS 4520, follow these steps:

**Step 1** Power off the appliance.

**Step 2** Remove the power cable from the appliance.

**Step 3** If your appliance has the fixed cable management brackets, do the following:

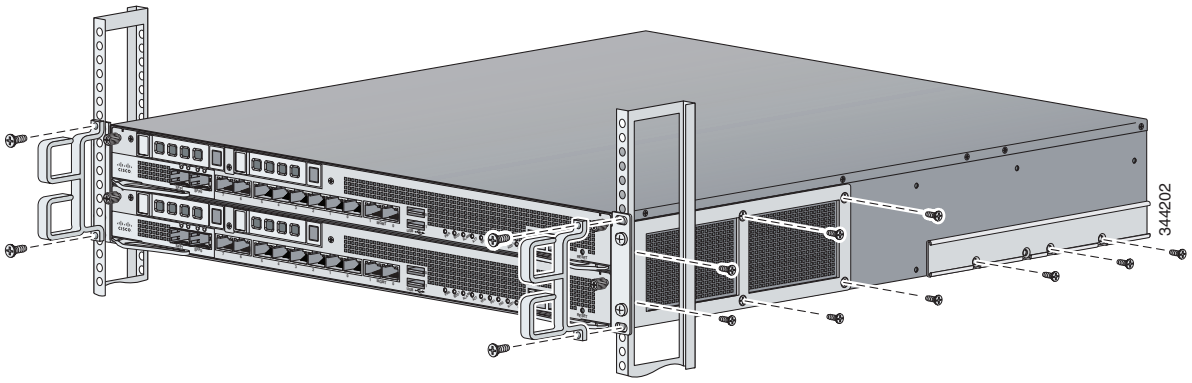
**a.** Remove the cable management brackets from the front sides of the appliance.

**b.** Remove the appliance from the rack.

**c.** Remove the front brackets, left and right side brackets, and left and right rear brackets from the appliance.

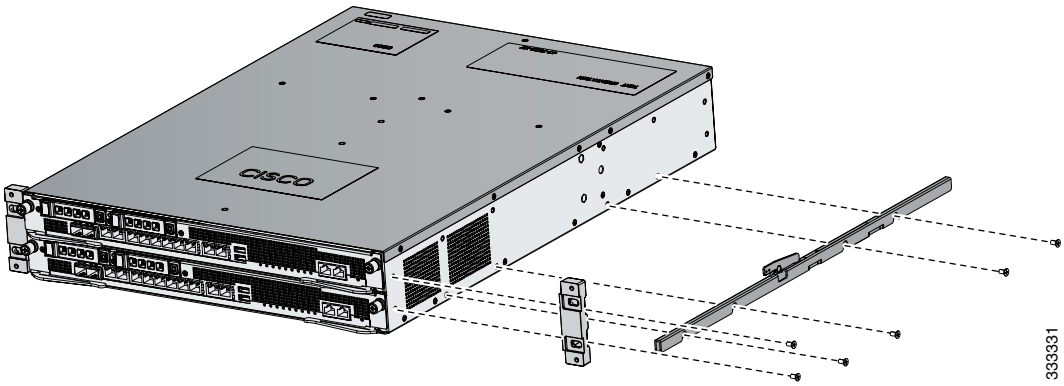
Figure 5-6 shows all of the brackets that can be removed for the fixed rack mount.

*Figure 5-6 Brackets for the Fixed Rack Mount*




**Step 4** Attach the slide rail kit hardware (front brackets and left and right side brackets) to the appliance. The brackets are labeled RIGHT and LEFT. This prepares the appliance for installation in the rack using the slide rail kit. Figure 5-7 shows all of the brackets you need to install on the appliance.

*Figure 5-7 Brackets for the Slide Rail Kit*




# Installing and Removing the Slide Rail Kit

After you have installed the slide rail kit hardware, you can install the slide rail kit. This section describes how to install and remove the slide rail kit for the IPS 4510 and IPS 4520, and contains the following sections:


- Package Contents, page 5-22
- Installing the Chassis in the Rack, page 5-22
- Removing the Chassis from the Rack, page 5-28

# Package Contents

The slide rail kit package contains the following items:

- Left and right slide rails
- Six #10-32 screws
- Two #10-32 cage nuts

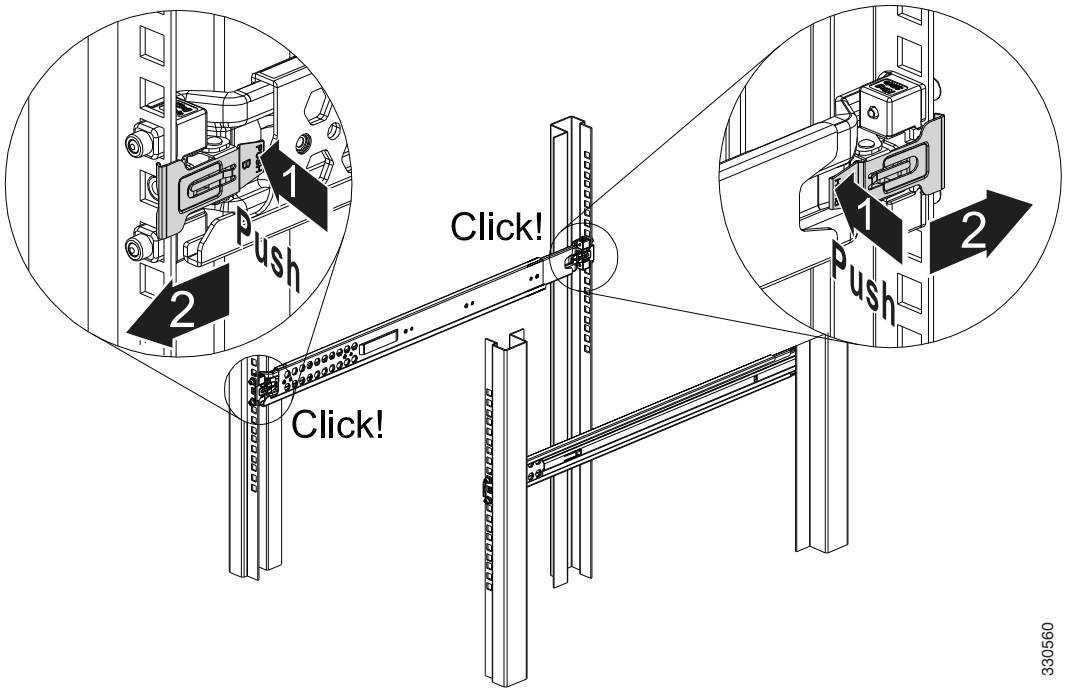
# Installing the Chassis in the Rack

To install the chassis in the rack using the slide rail kit, follow these steps:

**Step 1** Press the latch on the end of the slide rail and push forward to engage the pins in the rack until the clip clicks and locks around the rack post (Figure 5-8).

**Note** The slide rails are labeled ‘left’ and ‘right.’ Install the left slide rail on the left side of the rack and the right slide rail on the right side of the rack.

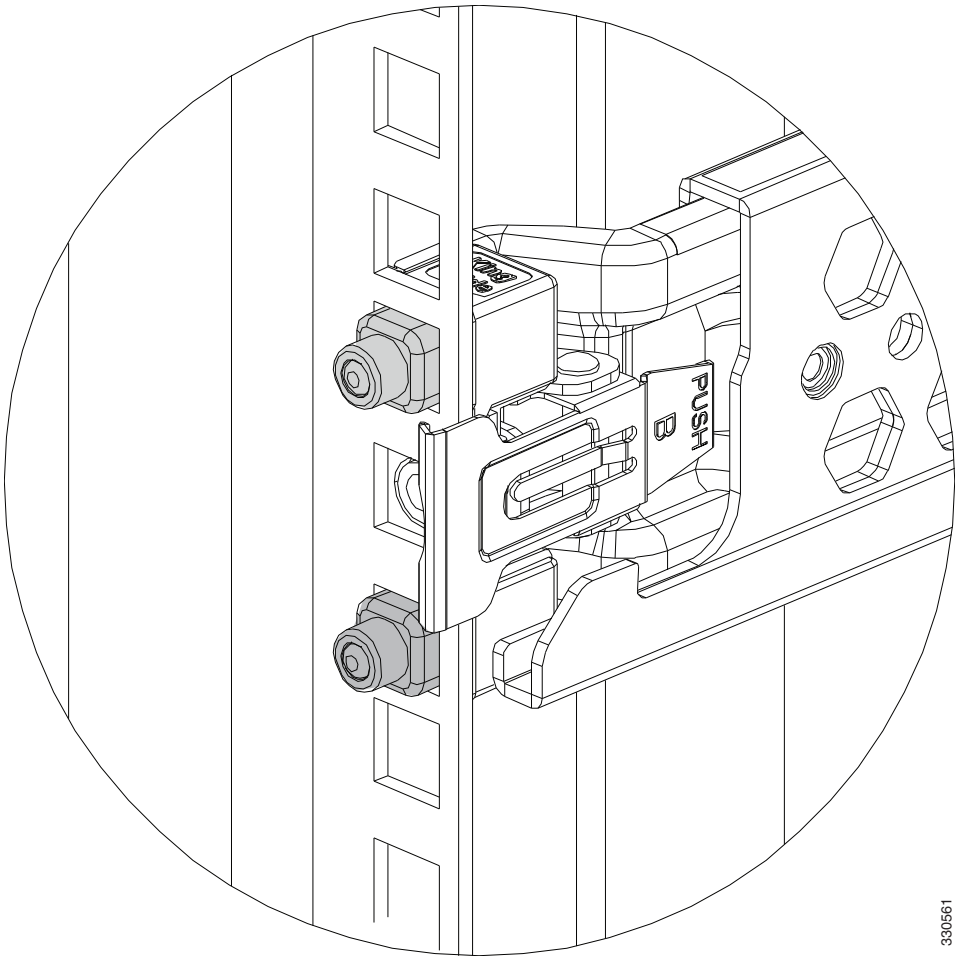
*Figure 5-8 Press and Push to Install the Slide Rail*



For square hole posts, square studs must be attached fully inside the square hole on the rack rail. For threaded hole posts, the round stud must fully enter inside the threaded hole rack rail (Figure 5-9).

**Note** After installing the square or round studs into the rack post, verify that the locking clip is fully seated and secure against the rack rail.

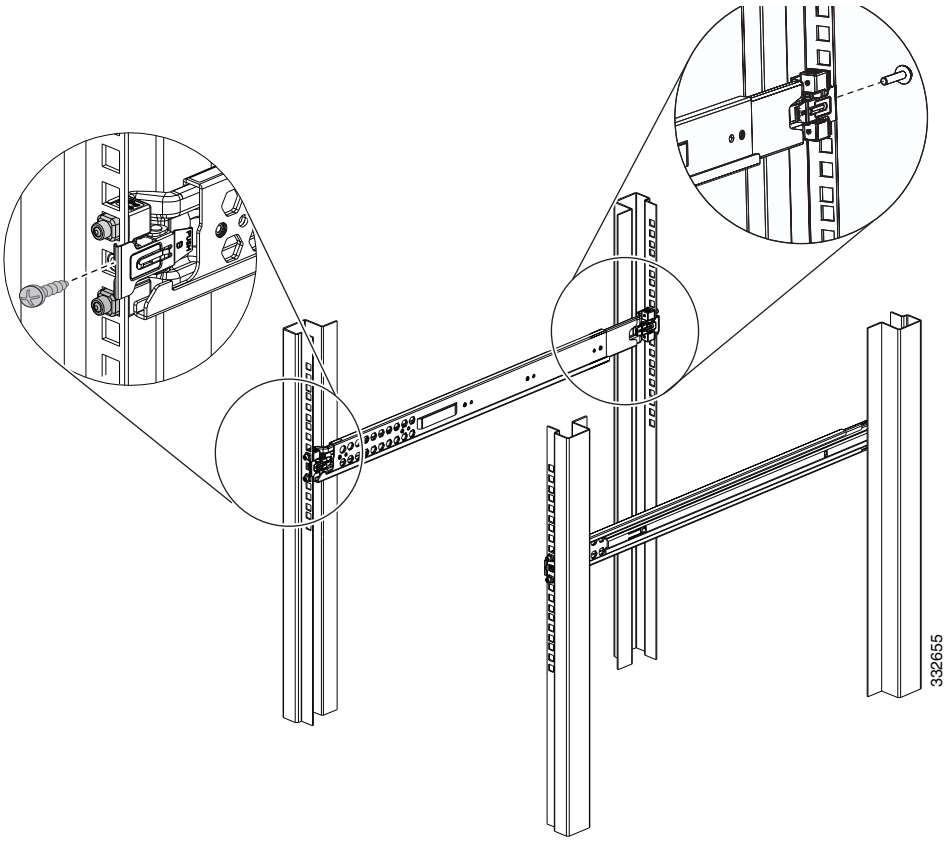
*Figure 5-9 Square Studs for Square Hole Post*



**Step 2** Secure the slide rail to the rack post with the provided #10-32 screws by tightening the screws at the front and rear end of the slide rail to the rack post (Figure 5-10). Both front and rear rack posts must be secured with the screws before you install the chassis.

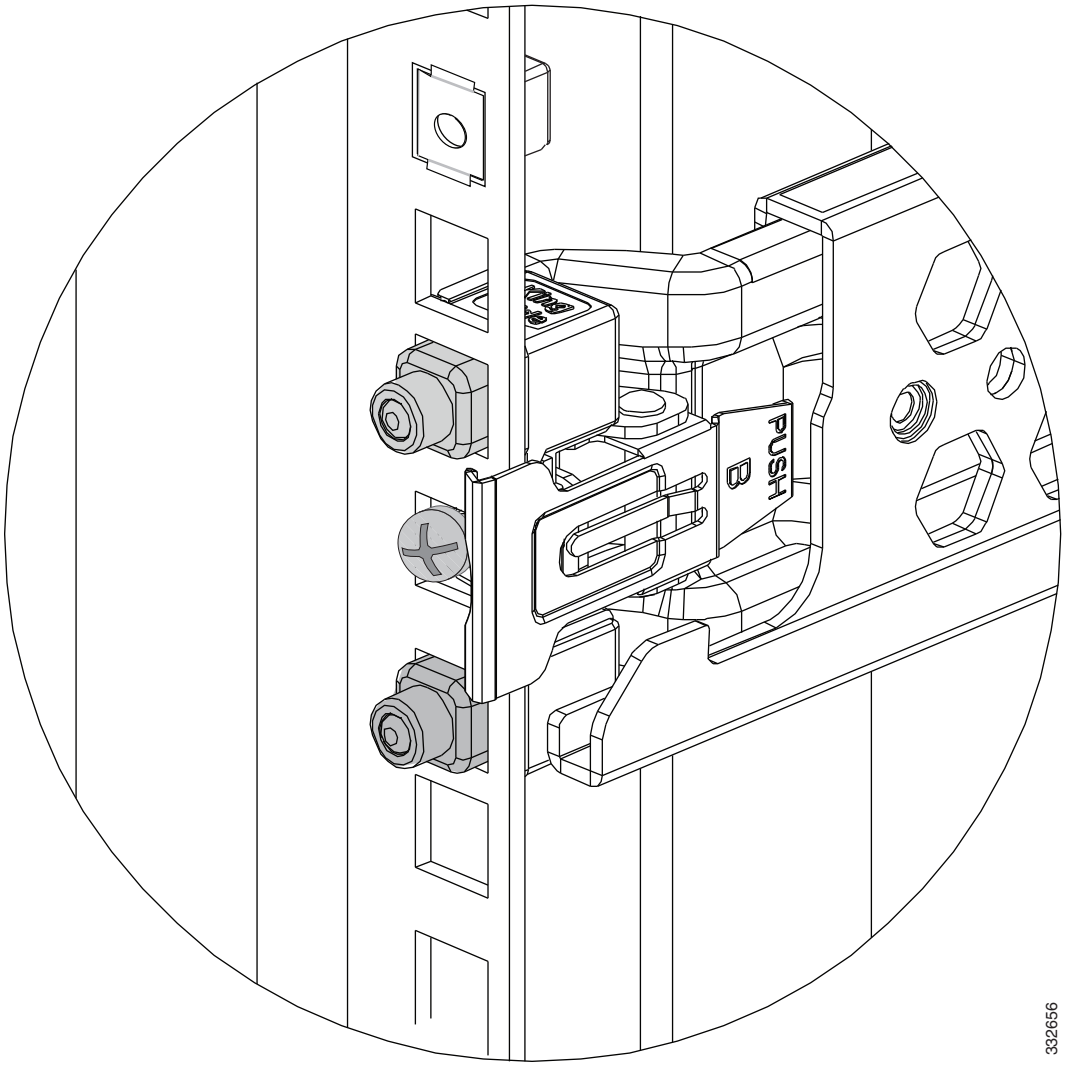
**Caution** It is critical that the screws are installed and secured to the front and rear end of the slide rails.

*Figure 5-10 Securing the Slide Rail to the Rack Post*



**Step 3** For square hole racks, install one #10-32 cage nut on each side of the rack rail (Figure 5-11). Leave one square hole spacing above the slide rail. The cage nut will be used later to secure the chassis to the rack post. For threaded hole racks, no additional hardware is needed.

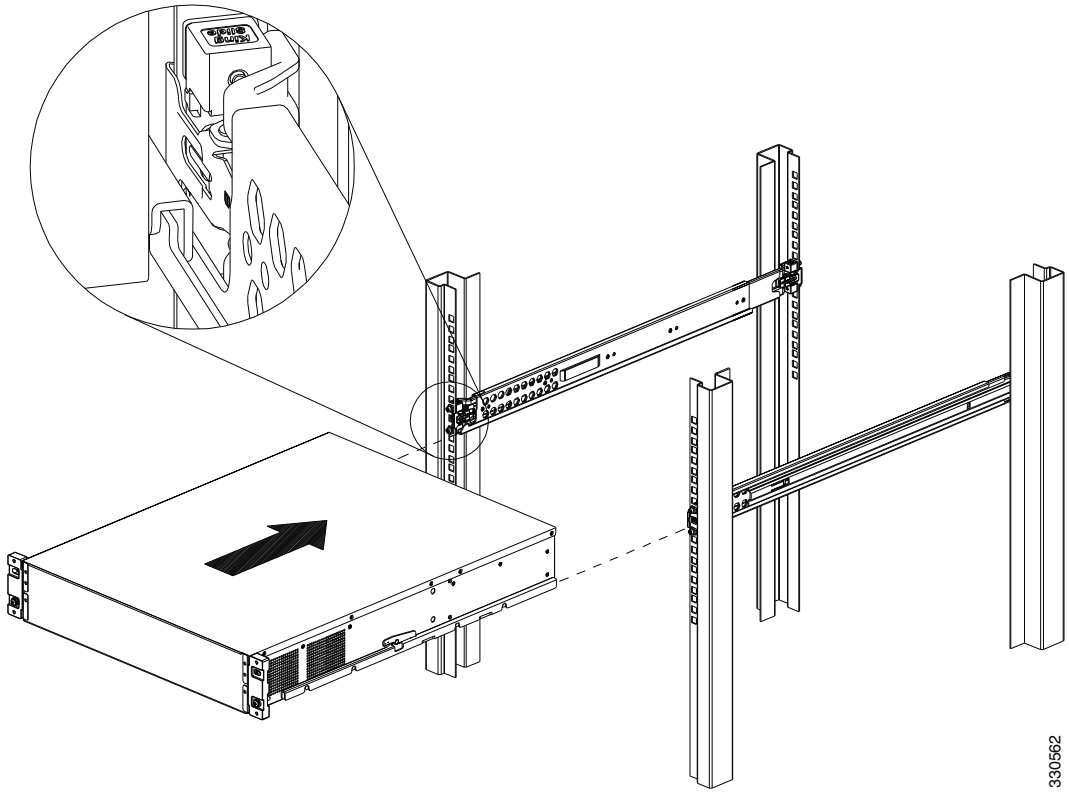
***Figure 5-11 Installing the #10-32 Cage Nuts***



**Step 4** Install the chassis on the outer rail. Make sure that the U-bars are aligned to the outer rail evenly, then push the chassis into the rack (Figure 5-12).

**Caution** Before installing the chassis, make sure that the slide rails are properly installed and that the perforated holes on the outer slide rail align with the perforated holes on the chassis.

*Figure 5-12 Installing the Chassis on the Outer Rail*

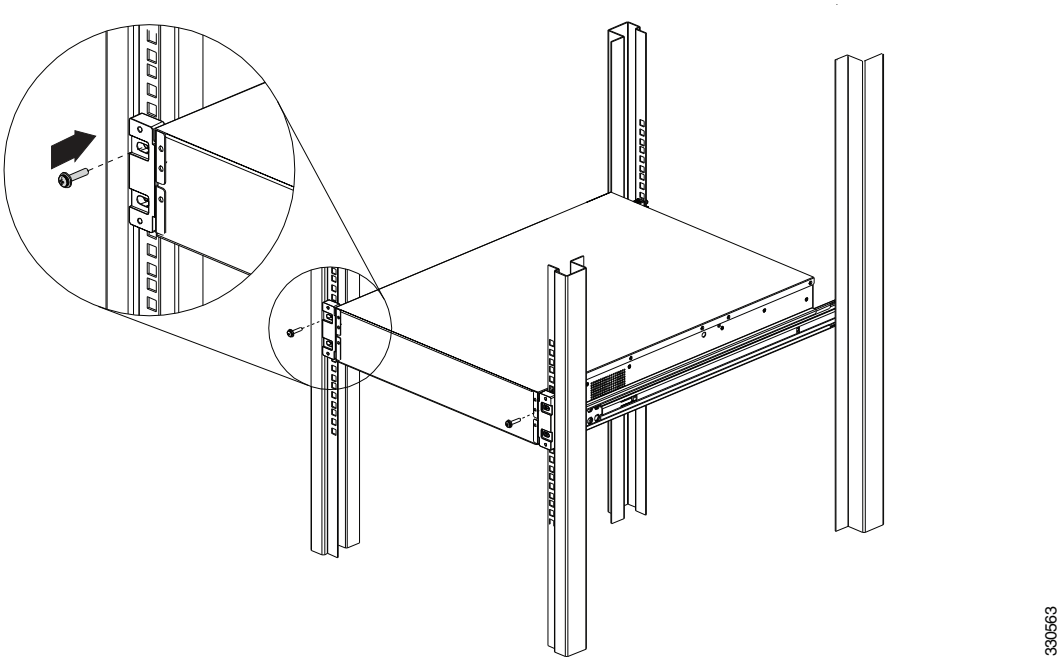


**Step 5** Tighten the screws to secure the chassis to the rack (Figure 5-13). Use the upper hole to secure the chassis to the rack.

**a.** For square hole racks, secure the chassis to the rack by installing the #10-32 screw into the cage nut that you installed in Step 3.

**b.** For threaded hole racks, secure the front of the chassis by installing the #10-32 screws into the rack threaded hole.

***Figure 5-13 Securing the Chassis to the Outer Rail***

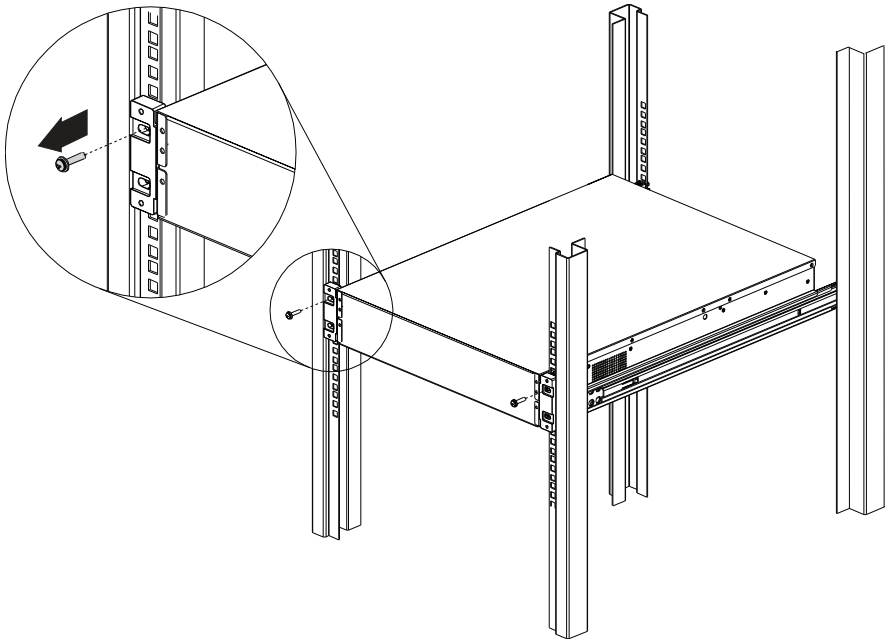


# Removing the Chassis from the Rack

To remove the chassis from the rack, follow these steps:

**Step 1** Remove the screws from the front brackets of the rail post (Figure 5-14).

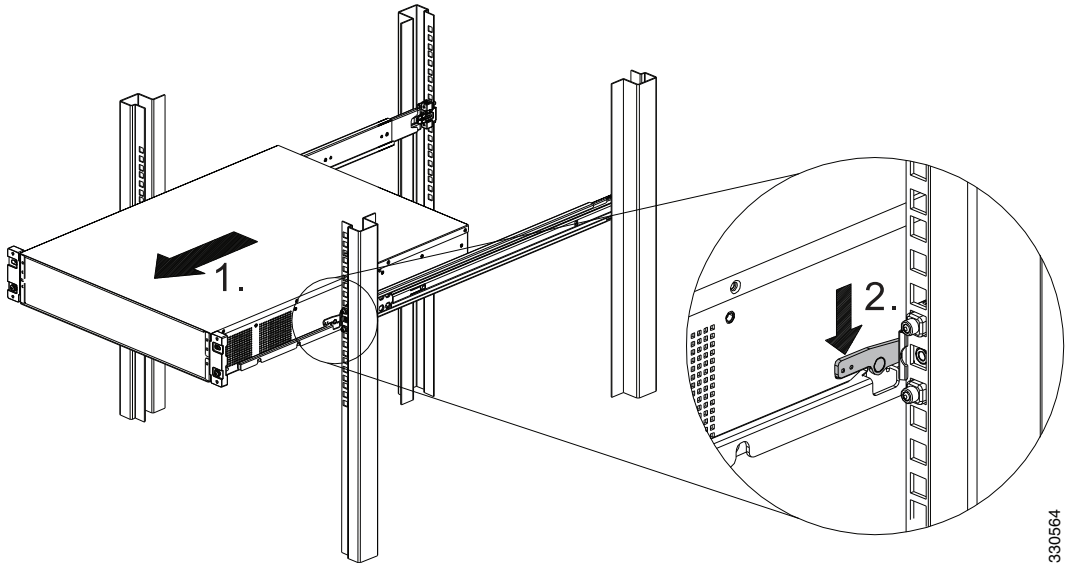
*Figure 5-14 Removing the Screws from the Outer Rail*




**Step 2** Pull out the chassis to the locked position.

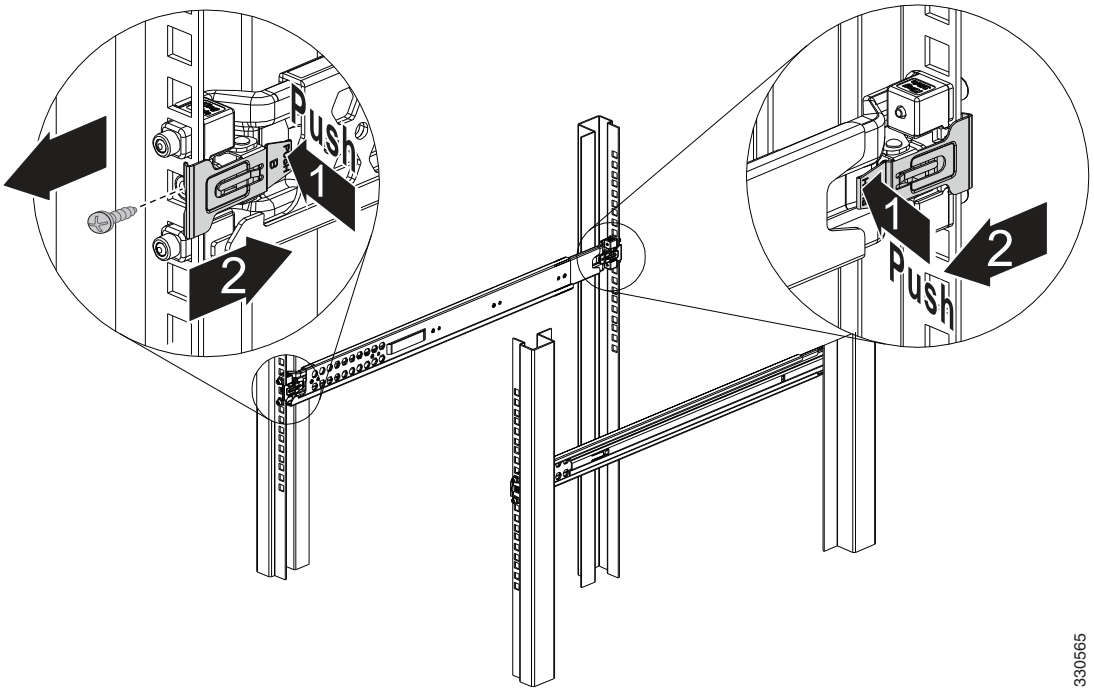
**Step 3** Press down the release hook to remove the chassis from the rack (Figure 5-15).

***Figure 5-15 Pressing Down the Release Hook***



**Step 4** Remove the two screws from the front and rear of the rack that are securing the slide rail, and release the latch and pull out the rails (Figure 5-16).

***Figure 5-16 Releasing the Latch to Pull Out the Rails***




# Rack-Mounting the Chassis Using the Fixed Rack Mount

If you are not able to use the slide rail kit in your rack installation, an optional fixed rack mount solution is available. You can install fixed front and rear rack mount brackets on the ASA 5585-X so that you can easily mount it in a rack.

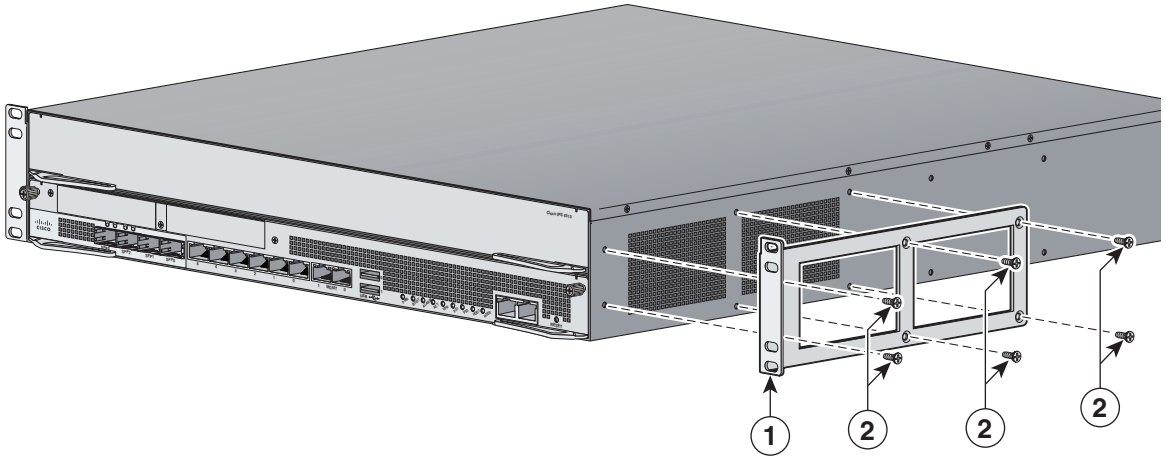
The IPS 4510 and the IPS 4520 ship with front rack mount brackets so that you can easily mount them in a rack.

To install the rack mount brackets on the sensor, follow these steps:

**Step 1** If the sensor is already operational and not rack-mounted, or if you are replacing one sensor with another sensor, do the following:

- Power off the sensor.
- Remove the power cable from the sensor.
- Remove the old sensor from the rack.

**Step 2** Position the front bracket on the side of the sensor and line up the bracket screws with the screw holes on the sensor.



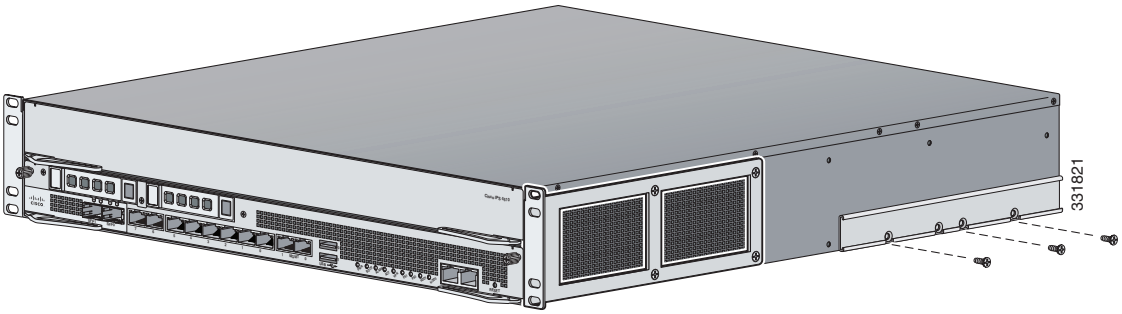

| | | | |
|---|---|---|---|
| **1** | Bracket | **2** | Bracket screws |

**Step 3** Tighten the screws in to the chassis.

**Step 4** Repeat the procedure on the other side of the chassis.

**Step 5** Mount the chassis in a rack. Go to Step 12. If using the optional slide rails, go to Step 6.

**Step 6** (Optional) Attach one of the rear brackets using three M4 screws.

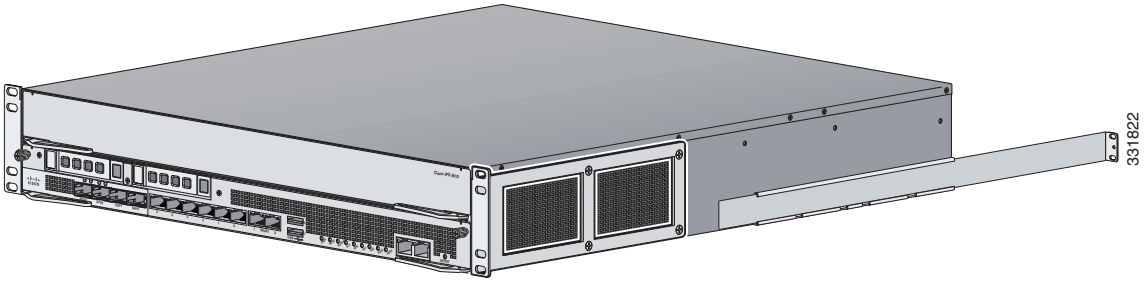



**Step 7** (Optional) Repeat the procedure to attach the second bracket to the other side of the chassis.

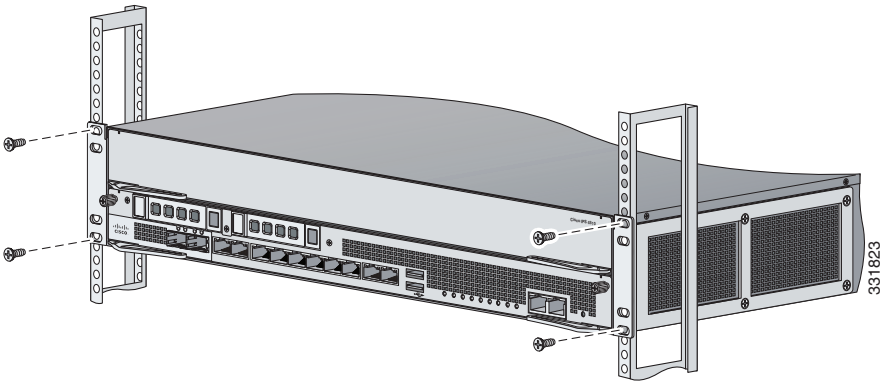
**Step 8** (Optional) Measure the distance between the front and rear rack rails and select the proper slide-mount brackets.

**Note** The slide-mount brackets let you install the rear of the chassis to the rear rack rails. The brackets are designed to slide within the installed rear brackets and accommodate a range of rack depths.

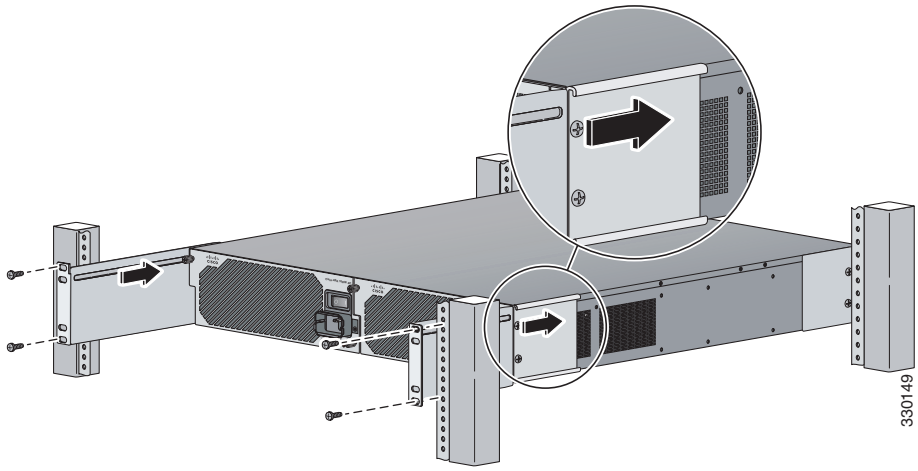
**Step 9** (Optional) Install the proper slide-mount brackets on to the rear bracket on the chassis.




**Step 10** (Optional) For added security, screw in the front brackets to the rack.




**Step 11** (Optional) Secure the slide brackets to the corresponding holes in the rear rack rail using the screws provided.




**Step 12** Reattach the power cable to the sensor.

**Step 13** Power on the sensor.

# Installing the Cable Management Brackets

The IPS 4510 and IPS 4520 ship with two cable management brackets that you can use to organize the cables connected to the sensor.

To install the cable management brackets on the sensor, follow these steps:

**Step 1** Power off the sensor.

**Step 2** Remove the power cable from the sensor.

**Step 3** Position the cable management brackets on the front side of the sensor, and line up the bracket screws with the screw holes on the sensor. Figure 5-17 shows the cable management bracket for the fixed rack mount and Figure 5-18 on page 5-34 shows the cable management bracket for the slide rail.

*Figure 5-17 Cable Management Brackets for the Fixed Rack Mount*

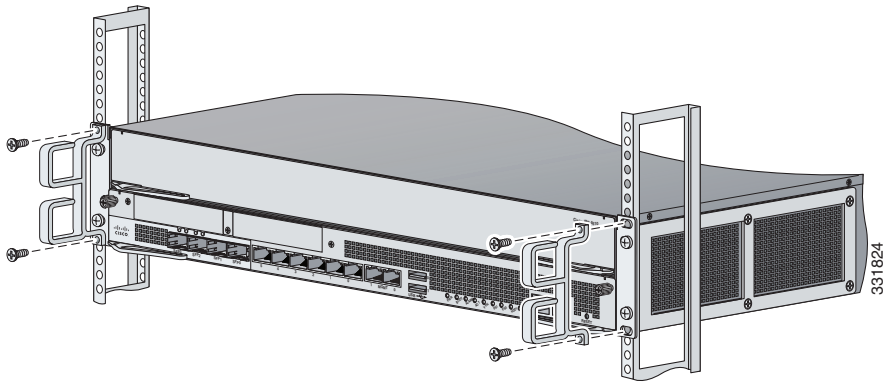
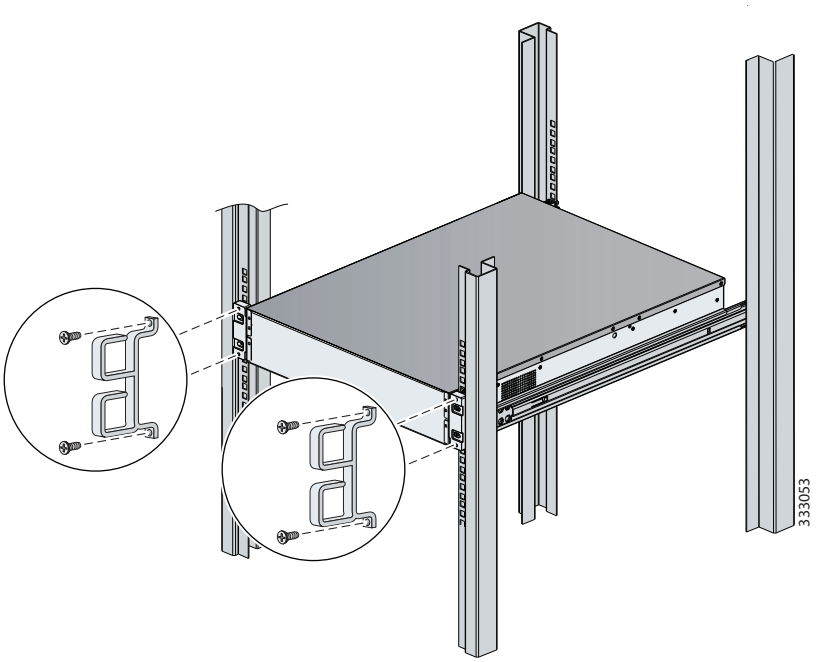


*Figure 5-18 Cable Management Brackets for the Slide Rail*




**Step 4** Tighten the screws in to the rack.

**Step 5** Reattach the power cable to the sensor.

**Step 6** Organize the cables through the cable management brackets on the sensor.

**Step 7** Power on the sensor.

# Troubleshooting Loose Connections

Perform the following actions to troubleshoot loose connections on sensors:

- Make sure all power cords are securely connected.
- Make sure all cables are properly aligned and securely connected for all external and internal components.
- Remove and check all data and power cables for damage. Make sure no cables have bent pins or damaged connectors.
- Make sure each device is properly seated.
- If a device has latches, make sure they are completely closed and locked.
- Check any interlock or interconnect indicators that indicate a component is not connected properly.
- If problems continue, remove and reinstall each device, checking the connectors and sockets for bent pins or other damage.

# IPS 4500 Series Sensors and the SwitchApp

The 4500 series sensors have a built in switch that provides the external monitoring interfaces of the sensor. The SwitchApp is part of the IPS 4500 series design that enables the InterfaceApp and sensor initialization scripts to communicate and control the switch. Any application that needs to get or set information on the switch must communicate with the SwitchApp. Additionally the SwitchApp implements the following:

- Detects bypass—When the SensorApp is not monitoring, the SwitchApp places the switch in bypass mode and then back to inspection mode once the SensorApp is up and running normally.
- Collects port statistics—The SwitchApp monitors the switch and collects statistics on the external interfaces of the switch for reporting by InterfaceApp.
- Handles the external interface configuration—When you update the interface configuration, the configuration is sent to the InterfaceApp, which updates the interface configuration for SwitchApp, which then forwards that configuration on to the switch.

### For More Information

For detailed information about the IPS system architecture, refer to System Architecture.

# Installing and Removing the ASA 5500 AIP SSM

## Contents

This chapter describes the ASA 5500 AIP SSM and contains the following sections:


- Installation Notes and Caveats, page 6-1
- Product Overview, page 6-2
- Specifications, page 6-4
- Memory Specifications, page 6-4
- Hardware and Software Requirements, page 6-4
- Indicators, page 6-5
- Installation and Removal Instructions, page 6-5


## Installation Notes and Caveats

Pay attention to the following installation notes and caveats before installing the ASA 5500 AIP SSM.

**Note** Read through the entire guide before beginning any of the installation procedures.

**Warning** **Only trained and qualified personnel should install, replace, or service this equipment.** Statement 49

**Caution** Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series Adaptive Security Appliance* document and follow proper safety procedures when performing the steps in this guide.

# Product Overview

The Cisco ASA Advanced Inspection and Prevention Security Services Module (ASA 5500 AIP SSM) is the IPS plug-in module in the Cisco ASA 5500 series adaptive security appliance. The adaptive security appliance software integrates firewall, VPN, and intrusion detection and prevention capabilities in a single platform.

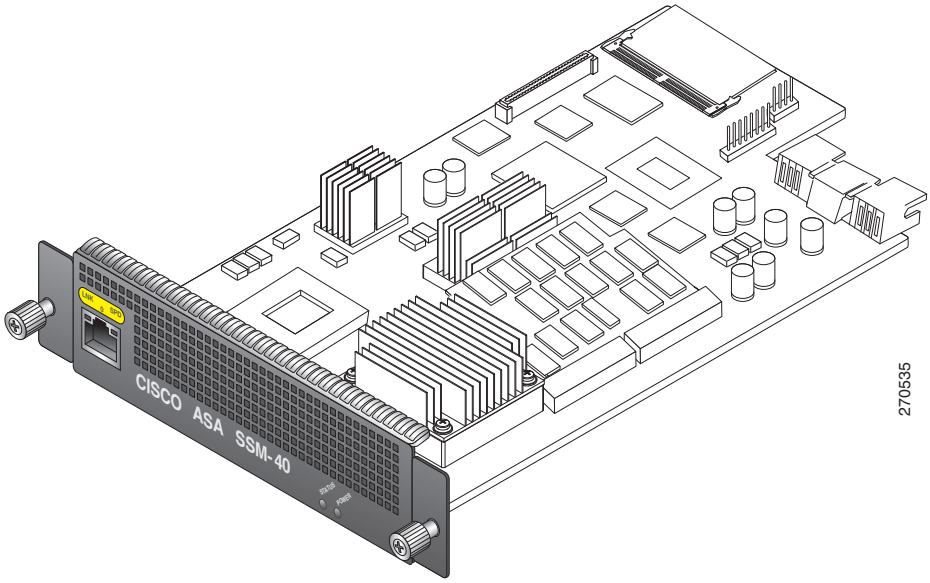
The ASA 5500 AIP SSM monitors and performs real-time analysis of network traffic by looking for anomalies and misuse based on an extensive, embedded signature library. When the ASA 5500 AIP SSM detects unauthorized activity, it can terminate the specific connection, permanently block the attacking host, log the incident, and send an alert to the device manager.

There are three models of the ASA 5500 AIP SSM:

- ASA-SSM-AIP-10-K9
  - Supports 150 Mbps of IPS throughput when installed in ASA 5510
  - Supports 225 Mbps of IPS throughput when installed in ASA 5520
- ASA-SSM-AIP-20-K9
  - Supports 375 Mbps of IPS throughput when installed in ASA 5520
  - Supports 500 Mbps of IPS throughput when installed in ASA 5540
- ASA-SSM-AIP-40-K9
  - Supports 450 Mbps of IPS throughput on the ASA 5520
  - Supports 650 Mbps IPS throughput on ASA 5540

Figure 6-1 shows the AIP SSM-40.

***Figure 6-1 AIP SSM-40***

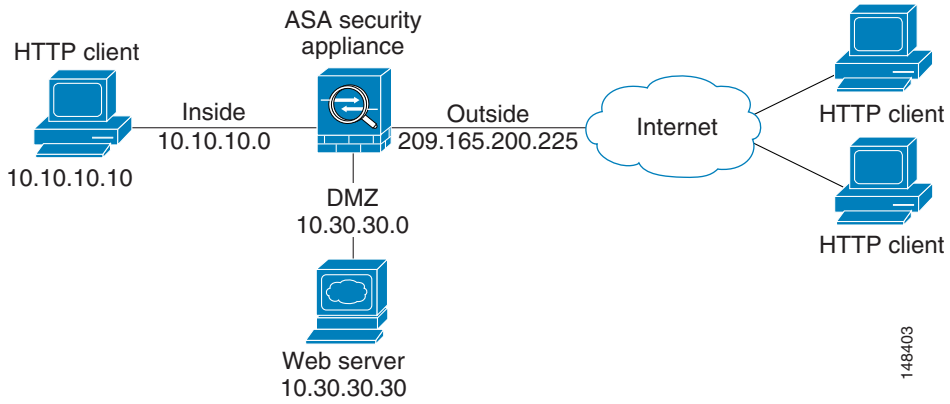



The ASA 5500 AIP SSM runs in either inline or promiscuous mode. The adaptive security appliance diverts packets to the ASA 5500 AIP SSM just before the packet exits the egress interface (or before VPN encryption occurs, if configured) and after other firewall policies are applied. For example, packets that are blocked by an access list are not forwarded to the ASA 5500 AIP SSM.

In promiscuous mode, the IPS receives packets over the GigabitEthernet interface, examines them for intrusive behavior, and generates alerts based on a positive result of the examination. In inline mode, there is the additional step of sending all packets, which did not result in an intrusion, back out the GigabitEthernet interface.

Figure 6-2 shows the adaptive security appliance with the ASA 5500 AIP SSM in a typical DMZ configuration. A DMZ is a separate network located in the neutral zone between a private (inside) network and a public (outside) network. The web server is on the DMZ interface, and HTTP clients from both the inside and outside networks can access the web server securely.

***Figure 6-2 DMZ Configuration***




In Figure 6-2 an HTTP client (10.10.10.10) on the inside network initiates HTTP communications with the DMZ web server (30.30.30.30). HTTP access to the DMZ web server is provided for all clients on the Internet; all other communications are denied. The network is configured to use an IP pool (a range of IP addresses available to the DMZ interface) of addresses between 30.30.30.50 and 30.30.30.60.

### For More Information

- For more information on setting up the adaptive security appliance, refer to the Getting Started Guides found at this URL:

  http://www.cisco.com/en/US/products/ps6120/prod_installation_guides_list.html

- For more information on installing the ASA 5500 AIP SSM, see Installing the ASA 5500 AIP SSM, page 6-5.
- For more information on configuring the ASA 5500 AIP SSM to receive IPS traffic, refer to Configuring the ASA 5500 AIP SSM.

# Specifications

Table 6-1 lists the specifications for the ASA 5500 AIP SSM:

*Table 6-1 ASA 5500 AIP SSM Specifications*

| Specification | Description |
|---|---|
| Dimensions (H x W x D) | 1.70 x 6.80 x 11.00 inches |
| Weight | Minimum: 2.50 lb<br>Maximum: 3.00 lb[1] |
| Operating temperature | +32° to +104°F (+0° to +40°C) |
| Nonoperating temperature | –40° to +167°F (–40° to +75°C) |
| Humidity | 10% to 90%, noncondensing |

1. 2.70 lb for 45 c heatsink, approximately 3.00 lb for the 55c maximum

# Memory Specifications

Table 6-2 lists the memory specifications for the ASA 5500 AIP SSM.

*Table 6-2 ASA 5500 AIP SSM Memory Specifications*

| Model | CPU | DRAM |
|---|---|---|
| ASA-SSM-AIP-10-K9 | 2.0 GHz Celeron | 1.0 GB |
| ASA-SSM-AIP-20-K9 | 2.4 GHz Pentium 4 | 2.0 GB |

# Hardware and Software Requirements

The ASA 5500 AIP SSM has the following hardware and software requirements:

- Cisco ASA 5500 series adaptive security appliance
  - ASA 5510 (ASA-SSM-AIP-10-K9)
  - ASA 5520 (ASA-SSM-AIP-10-K9 and ASA-SSM-AIP-20-K9)
  - ASA 5540 (ASA-SSM-AIP-20-K9)
- Cisco Adaptive Security Appliance Software 7.0 or later
- Cisco Intrusion Prevention System Software 5.0(2) or later
- DES or 3DES-enabled

# Indicators

Figure 6-3 shows the ASA 5500 AIP SSM indicators.

*Figure 6-3 ASA 5500 AIP SSM Indicators*

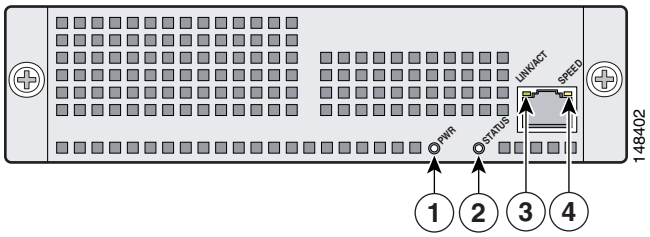



Table 6-3 describes the ASA 5500 AIP SSM indicators.

*Table 6-3 ASA 5500 AIP SSM Indicators*

| | LED | Color | State | Description |
|---|---|---|---|---|
| 1 | PWR | Green | On | The system has power. |
| 2 | STATUS | Green | Flashing | The system is booting. |
| | | | Solid | The system has passed power-up diagnostics. |
| 3 | LINK/ACT | Green | Solid | There is Ethernet link. |
| | | | Flashing | There is Ethernet activity. |
| 4 | SPEED | Green | 100 MB | There is network activity. |
| | | Amber | 1000 MB (GigabitEthernet) | There is network activity. |

# Installation and Removal Instructions

This section describes how to install and remove the ASA 5500 AIP SSM, and contains the following topics:


- Installing the ASA 5500 AIP SSM, page 6-5
- Verifying the Status of the ASA 5500 AIP SSM, page 6-7
- Removing the ASA 5500 AIP SSM, page 6-7

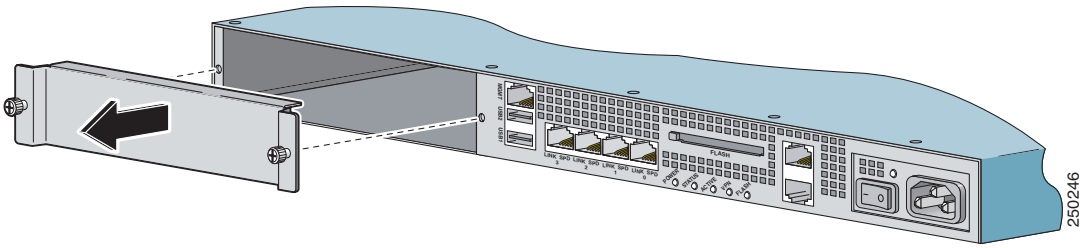

## Installing the ASA 5500 AIP SSM

To install the ASA 5500 AIP SSM for the first time, follow these steps:

**Step 1** Power off the adaptive security appliance.

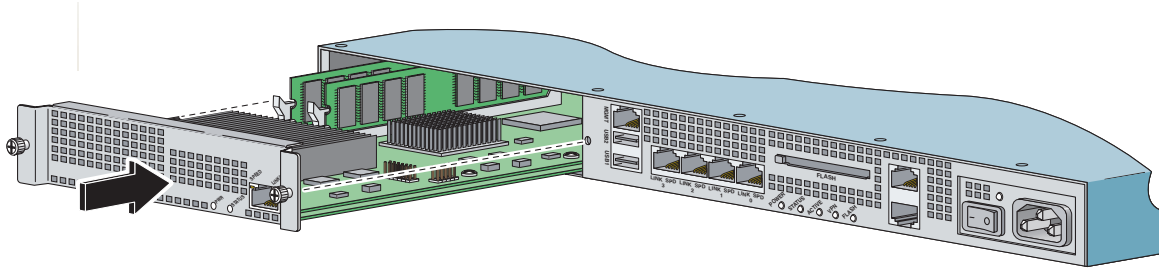
**Step 2** Locate the grounding strap from the accessory kit and fasten it to your wrist so that it contacts your bare skin. Attach the other end to the chassis.

**Step 3** Remove the two screws at the left back end of the chassis, and remove the slot cover.




**Note** Store the slot cover in a safe place for future use. You must install slot covers on all empty slots. This prevents EMI, which can disrupt other equipment.

**Step 4** Insert the ASA 5500 AIP SSM through the slot opening.



**Step 5** Attach the screws to secure the ASA 5500 AIP SSM to the chassis.

**Step 6** Power on the adaptive security appliance by pushing the power switch at the back of the chassis.

**Step 7** Check the indicators. If the ASA 5500 AIP SSM is properly installed, the POWER indicator is solid green and the STATUS indicator is flashing green. You can also verify that the ASA 5500 AIP SSM is online using the **show module 1** command.

**Step 8** Initialize the ASA 5500 AIP SSM.

**Step 9** Install the most recent Cisco IPS software.

**Step 10** Configure the ASA 5500 AIP SSM to receive IPS traffic.

### For More Information

- For more information about ESD, see Working in an ESD Environment, page 2-4.
- For the procedure for verifying that the ASA 5500 AIP SSM is properly installed, see Verifying the Status of the ASA 5500 AIP SSM, page 6-7.
- For the procedure for using the **setup** command to initialize the ASA 5500 AIP SSM, see Appendix B, “Initializing the Sensor.”.
- For the procedure for obtaining the latest Cisco IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for configuring the ASA 5500 AIP SSM to receive IPS traffic, refer to Configuring the ASA 5500 AIP SSM.

- For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.

# Verifying the Status of the ASA 5500 AIP SSM

You can use the **show module 1** command to verify that the ASA 5500 AIP SSM is up and running.

The following values are valid for the Status field:

- `Initializing`—The ASA 5500 AIP SSM is being detected and the control communication is being initialized by the system.
- `Up`—The ASA 5500 AIP SSM has completed initialization by the system.
- `Unresponsive`—The system encountered an error communicating with the ASA 5500 AIP SSM.
- `Reloading`—The ASA 5500 AIP SSM is reloading.
- `Shutting Down`—The ASA 5500 AIP SSM is shutting down.
- `Down`—The ASA 5500 AIP SSM is shut down.
- `Recover`—The ASA 5500 AIP SSM is attempting to download a recovery image.

To verify the status of the ASA 5500 AIP SSM, follow these steps:

**Step 1** Log in to the adaptive security appliance.

**Step 2** Verify the status of ASA 5500 AIP SSM. If the status reads `Up`, the ASA 5500 AIP SSM has been properly installed.

```
asa# show module 1
Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
  1 ASA 5500 Series Security Services Module-20  ASA-SSM-20         P2B000005D0

Mod MAC Address Range                 Hw Version   Fw Version   Sw Version
--- --------------------------------- ------------ ------------ ---------------
  1 000b.fcf8.0144 to 000b.fcf8.0144  0.2          1.0(9)0      5.0(0.27)S129.0

Mod Status
--- ------------------
  1 Up
asa#
```

# Removing the ASA 5500 AIP SSM

To remove the ASA 5500 AIP SSM from the adaptive security appliance, follow these steps:

**Step 1** Shut down the ASA 5500 AIP SSM.

```
asa# hw-module module 1 shutdown
Shutdown module in slot 1? [confirm]
```

**Step 2** Press **Enter** to confirm.

**Step 3** Verify that the ASA 5500 AIP SSM is shut down by checking the indicators.

**Step 4** Power off the adaptive security appliance.

**Step 5** Locate the grounding strap from the accessory kit and fasten it to your wrist so that it contacts your bare skin. Attach the other end to the chassis.

**Step 6** Remove the two screws at the left back end of the chassis.

**Step 7** Remove the ASA 5500 AIP SSM and set it aside.

**Note** If you are not replacing the ASA 5500 AIP SSM immediately, install the blank slot cover. Slot covers must cover all empty slots. This prevents EMI from disrupting other equipment.

**Step 8** If you need to replace the existing the ASA 5500 AIP SSM, insert the new ASA 5500 AIP SSM through the slot opening.

**Note** Do not replace the ASA 5500 AIP SSM with a different model. The the adaptive security appliance will not recognize it.

**Step 9** Attach the screws to secure the ASA 5500 AIP SSM to the chassis.

**Step 10** Power on the adaptive security appliance.

**Step 11** Reset the ASA 5500 AIP SSM.

```
asa# hw-module module 1 reset
Reset module in slot 1? [confirm]
```

**Step 12** Press **Enter** to confirm.

**Step 13** Check the indicators to see if the ASA 5500 AIP SSM is properly installed. If the ASA 5500 AIP SSM is properly installed, the POWER indicator is solid green and the STATUS indicator is flashing green. Or you can verify installation using the **show module 1**command.

### For More Information

- For more information on ESD, see Safety Recommendations, page 2-2.
- For the procedure for verifying whether the ASA 5500 AIP SSM is properly installed, see Verifying the Status of the ASA 5500 AIP SSM, page 6-7.

# Installing and Removing the ASA 5585-X IPS SSP

## Contents

This chapter describes the Cisco ASA 5585-X IPS SSP, and contains the following sections:


- Installation Notes and Caveats, page 7-1
- Introducing the ASA 5585-X IPS SSP, page 7-2
- Specifications, page 7-3
- Hardware and Software Requirements, page 7-4
- Front Panel Features, page 7-4
- Memory Requirements, page 7-8
- SFP/SFP+ Modules, page 7-9
- Installing the ASA 5585-X IPS SSP, page 7-9
- Installing SFP/SFP+ Modules, page 7-11
- Verifying the Status of the ASA 5585-X IPS SSP, page 7-12
- Removing and Replacing the ASA 5585-X IPS SSP, page 7-13


**Warning** **Only trained and qualified personnel should install, replace, or service this equipment.** Statement 49

## Installation Notes and Caveats

Pay attention to the following installation notes and caveats before installing the ASA 5585-X IPS SSP:

- Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco ASA 5585-X Adaptive Security Appliance* document and follow proper safety procedures when performing the steps in this guide.
- The ASA 5585-X IPS SSP is supported in ASA 8.2(4.4) and later as well as ASA 8.4(2) and later. It is not supported in ASA 8.3(*x*).
- The ASA 5585-X IPS SSP does not require any cabling. If you have an ASA 5585-X IPS SSP, you can use the ASA 5585-X IPS SSP nonmanagement interfaces as additional network interfaces.
- Read through the entire guide before beginning any of the installation procedures.

# Introducing the ASA 5585-X IPS SSP

You can install the Cisco Intrusion Prevention System Security Services Processor (ASA 5585-X IPS SSP) in the ASA-5585-X adaptive security appliance. The ASA 5585-X is a 2RU, two-slot chassis. The Security Services Processor (ASA 5585-X SSP) resides in slot 0 (the bottom slot) and the ASA 5585-X IPS SSP resides in slot 1 (the top slot). All port numbers are numbered from right to left beginning with 0.

The ASA 5585-X series with the IPS SSP comes in four models:

- ASA 5585-X IPS-10 with IPS SSP-10
- ASA 5585-X IPS-20 with IPS SSP-20
- ASA 5585-X IPS-40 with IPS SSP-40
- ASA 5585-X IPS-60 with IPS SSP-60

In addition to world-class performance, the ASA 5585-X deploys encrypted traffic inspection, port density (up to 20 interfaces depending on the model), and feature performance matching, that is, performance parity between firewall and IPS functions. All ASA 5585-X series adaptive security appliances ship with a core SSP (ASA 5585-X SSP); the ASA 5585-X IPS SSP is optional. You must have the core SSP to run the ASA 5585-X IPS SSP.

**Note** Online insertion and removal (OIR) of the security services processors is not supported at this time. SFP/SFP+, power supply module, and fan module OIR is supported.

### IDM

The ASA 5585-X IPS SSP supports the Intrusion Prevention System Device Manager (IDM) 7.1. The IDM delivers security management and monitoring through an intuitive, easy-to-use web-based management interface. The IDM is a Java Web Start application that enables you to configure and manage your ASA 5585-X IPS SSP. The IDM is bundled with IPS 7.1. You can access it through Internet Explorer or Firefox web browsers.

### IME

The Intrusion Prevention System Manager Express (IME) 7.1 also supports the ASA 5585-X IPS SSP. The IME is a network management application that provides system health, events, and collaboration monitoring in addition to reporting and configuration for up to ten sensors. The IME monitors sensor health using customizable dashboards and provides security alerts through RSS feed integration from the Cisco Security Intelligence Operations site. It monitors global correlation data, which you can view in events and reports. It monitors events and lets you sort views by filtering, grouping, and colorization. The IME also supports tools such as ping, trace route, DNS lookup, and whois lookup for selected events. It contains a flexible reporting network. It embeds the IDM configuration component to allow for a seamless integration between the monitoring and configuration of IPS devices. Within the IME you can set up your sensors, configure policies, monitor IPS events, and generate reports. The IME works in single application mode—the entire application is installed on one system and you manage everything from that system.

### ASA 5585-X SSP-10 With IPS SSP-10

The ASA 5585-X SSP-10 with IPS SSP-10 provides firewall, VPN support, intrusion prevention system protection, and 20 interfaces (2 SFP/SFP+ and 18 copper Gigabit Ethernet). The SSP-10 with IPS SSP-10 has one power supply module and one fan module. You can replace the fan module with

another power supply module for a redundant power supply configuration. The SSP-10 with IPS SSP-10 has two CPUs, six DIMM modules, two embedded crypto accelerator, and two dual-port 10-GB uplinks for the SFP/SFP+ interfaces.

#### ASA 5585-X SSP-20 With IPS SSP-20

The ASA 5585-X SSP-20 with IPS SSP-20 provides firewall, VPN support, intrusion prevention system protection, and 20 interfaces (2 SFP/SFP+ and 18 copper Gigabit Ethernet). The SSP-20 with IPS SSP-20 has one power supply module and one fan module. You can replace the fan module with another power supply module for a redundant power supply configuration. The SSP-20 with IPS SSP-20 has two CPUs, 12 DIMM modules, four embedded crypto accelerators, and two dual-port 10-GB uplinks for the SFP/SFP+ interfaces.

#### ASA 5585-X SSP-40 With IPS SSP-40

The ASA 5585-X SSP-40 with IPS SSP-40 provides firewall, VPN support, intrusion prevention system protection, and 20 interfaces (4 SFP/SFP+ and 16 copper Gigabit Ethernet). The SSP-40 with IPS SSP-40 has one power supply module and one fan module. You can replace the fan module with another power supply module for a redundant power supply configuration. The SSP-40 with IPS SSP-40 has four CPUs, 12 DIMM modules, six embedded crypto accelerators, and four dual-port 10-GB uplinks for the SFP/SFP+ interfaces.

#### ASA 5585-X SSP-60 With IPS SSP-60

The ASA 5585-X SSP-60 with IPS SSP-60 provides firewall, VPN support, intrusion prevention system protection, and 20 interfaces (4 SFP/SFP+ and 16 copper Gigabit Ethernet). The SSP-60 with IPS SSP-60 ships with two power supply modules; however, the SSP-60 with IPS SSP-60 can function with only one power supply module. Although the SSP-60 with IPS SSP-60 can also operate with only one power supply module, we recommend that you install two power supply modules for extended reliability since the power supply modules operate in load-sharing mode. If one fails in this configuration, the other power supply module can still handle the full load until the failed power supply module is replaced. The SSP-60 with IPS SSP-60 has four CPUs, 24 DIMM modules, eight embedded crypto accelerators, and four dual-port 10-GB uplinks for the SFP/SFP+ interfaces.

**Caution** If you remove a power supply or fan module, replace it immediately to prevent disruption of service.

# Specifications

Table 7-1 lists the specifications for the ASA 5585-X IPS SSP.

*Table 7-1 ASA 5585-X IPS SSP Specifications*

| | |
|---|---|
| Height | 1.70 in |
| Width | 17.00 in |
| Depth | 15.50 in |
| Weight | 11.50 lb |
| Temperature | Operating 32 to 104°F (0 to 40°C)<br>Nonoperating -40°F to 167°F (-40°C to 75°C) |
| Relative humidity (noncondensing) | Operating 10% to 90%<br>Nonoperating 5% to 95% |

# Hardware and Software Requirements

The ASA 5585-X IPS SSP has the following hardware and software requirements:

- Cisco ASA 5585-X adaptive security appliance
  - ASA 5585-X SSP-10 with IPS SSP-10
  - ASA 5585-X SSP-20 with IPS SSP-20
  - ASA 5585-X SSP-40 with IPS SSP-40
  - ASA 5585-X SSP-60 with IPS SSP-60
- Cisco Adaptive Security Appliance Software ASA 8.2(4.4) and later
- Cisco Adaptive Security Appliance Software ASA 8.4(2) and later

**Note** The ASA 5585-X IPS SSP is not supported in ASA 8.3(*x*).

- Cisco Intrusion Prevention System Software 7.1(1)E4 and later
- 3DES-enabled

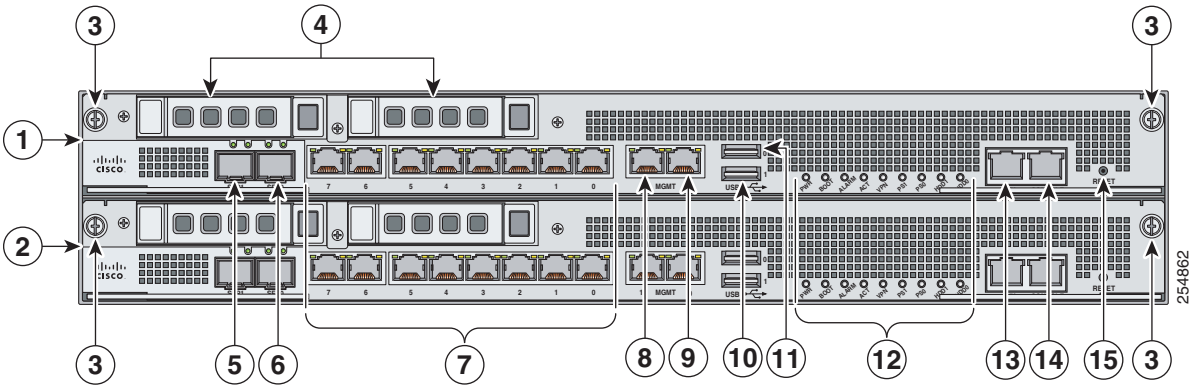
# Front Panel Features

This section describes the front features and indicators of the ASA 5585-X IPS SSP. The SFP and SFP+ modules are optional and not included with the ASA 5585-X IPS SSP. You can purchase them separately. For 10 Gb, you need SFP+. For 1 Gb, you need SFP. The two ports are the same, but you can only use 10 Gb if you buy a license. Otherwise, the ports are restricted to 1 Gb. The ports are always 10 GB-enabled for the IPS SSP-40 and IPS SSP-60. The interfaces are called TenGigabitEthernet 1/*x* whether they are 10 GB-enabled or not.

Figure 7-1 shows the front view of the IPS SSP-10 and IPS SSP-20.

**Note** The illustration shows IPS SSP-10, but it applies to both the -10 and -20 models.

*Figure 7-1 IPS SSP-10 Front Panel View*



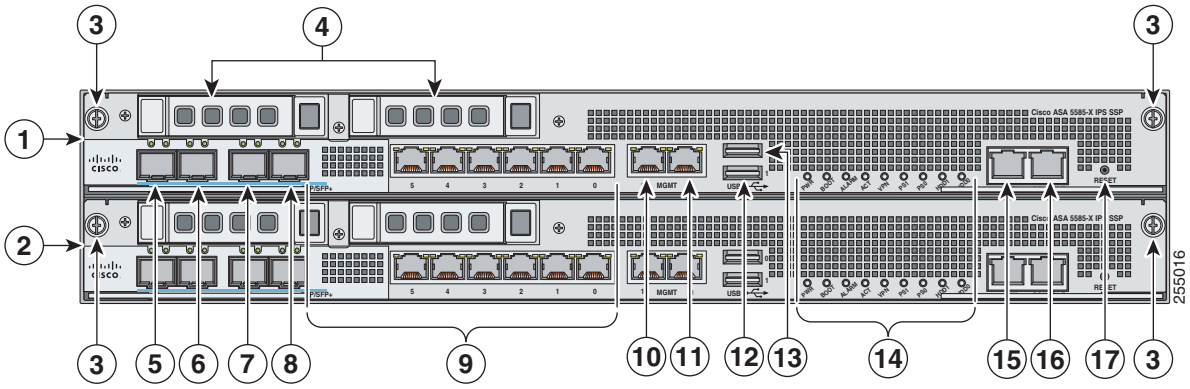
| | | | |
|---|---|---|---|
| **1** | ASA 5585-X IPS SSP (Slot 1) | **9** | Management 0/0 (GigabitEthernet RJ45) |
| **2** | SSP (Slot 0) | **10** | USB port |
| **3** | SSP/ASA 5585-X IPS SSP Removal Screws | **11** | USB port |
| **4** | Reserved bays for hard disk drives[1] | **12** | Front panel indicators |
| **5** | TenGigabitEthernet 0/1 (10-Gb fiber, SFP, or SFP+) | **13** | Auxiliary port (RJ45) |
| **6** | TenGigabitEthernet 0/0 (1-Gb fiber, SFP, or SFP+) | **14** | Console port (RJ45) |
| **7** | GigabitEthernet 1/0 through 1/7, from right to left (1-Gb copper, RJ45) | **15** | Eject[2] |
| **8** | Management 0/1 (GigabitEthernet RJ45) | | |

1. Hard disk drives are not supported at this time. The hard disk drive bays are empty.
2. Reserved for future use for OIR.

Figure 7-2 shows the front view of IPS SSP-40 and IPS SSP-60.

**Note** The illustration shows IPS SSP-40, but it applies to both the -40 and the -60 models.

***Figure 7-2 IPS SSP-40 Front Panel View***



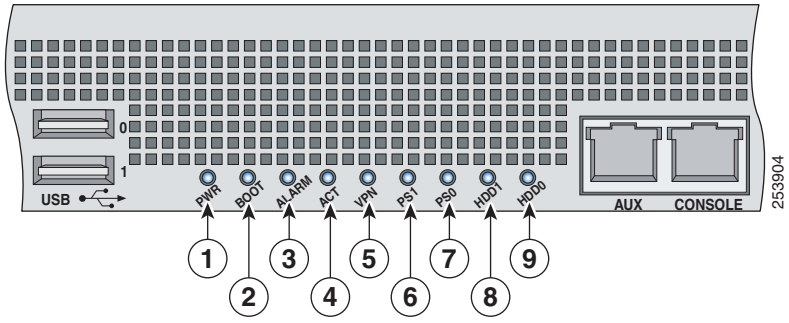

| | | | |
|---|---|---|---|
| **1** | ASA 5585-X IPS SSP (slot 1) | **10** | Management 1/1 (GigabitEthernet RJ45) |
| **2** | SSP (slot 0) | **11** | Management 1/0 (GigabitEthernet RJ45) |
| **3** | SSP/ASA 5585-X IPS SSP removal screws | **12** | USB port |
| **4** | Reserved bays for hard disk drives[1] | **13** | USB port |

| | | | |
|---|---|---|---|
| **5** | TenGigabitEthernet 1/9 (<br>(10-Gb fiber, SFP, or SFP+) | **14** | Front panel indicators |
| **6** | TenGigabitEthernet 1/8<br>(1-Gb fiber, SFP, or SFP+) | **15** | Auxiliary port (RJ45) |
| **7** | TenGigabitEthernet 1/7<br>(10-Gb fiber, SFP, or SFP+) | **16** | Console port (RJ45) |
| **8** | TenGigabitEthernet 0/6 (SSP in slot 2)<br>TenGigabitEthernet 1/6 (ASA 5585-X IPS SSP in slot 1)<br>(1-Gb fiber, SFP, or SFP+) | **17** | Eject[2] |
| **9** | GigabitEthernet 0/0 through 0/5 (SSP in slot 2)<br>GigabitEthernet 1/0 through 1/5<br>(ASA 5585-X IPS SSP in slot 1)<br>(from right to left, 1-Gb copper, RJ45) | | |

1. Hard disk drives are not supported at this time. The hard disk drive bays are empty.
2. Reserved for future use for OIR.

Figure 7-3 shows the front panel indicators.

***Figure 7-3 ASA 5585-X IPS SSP Front Panel Indicators***




| | | | |
|---|---|---|---|
| **1** | PWR | **2** | BOOT |
| **3** | ALARM | **4** | ACT |
| **5** | VPN | **6** | PS1 |
| **7** | PS0 | **8** | HDD1 |
| **9** | HDD2 | | |

Table 7-2 describes the front panel indicators on the ASA 5585-X IPS SSP.

*Table 7-2 ASA 5585-X IPS SSP Front Panel Indicators*

| Indicator | Description |
|---|---|
| PWR | Indicates whether the system is off or on:<br>• Off—No power.<br>• Green—System has power. |
| BOOT | Indicates how the power-up diagnostics are proceeding:<br>• Flashing green—Power-up diagnostics are running or the system is booting.<br>• Green—System has passed power-up diagnostics.<br>• Amber—Power-up diagnostics failed. |
| ALARM[1] | Indicates whether a component has failed:<br>• Off—No alarm.<br>• Flashing yellow—Critical alarm.<br>Major failure of hardware component or software module, temperature over the limit, power out of tolerance, or OIR is ready to remove the module.[2]. |
| ACT | Indicates the status of an HA pair:<br>• Green—Status of an HA pair. |
| VPN | Indicates whether a VPN tunnel has been established:<br>• Green—VPN tunnel is established. |
| PS1 | Indicates the state of the power supply module installed on the right when facing the back panel:<br>• Off—No power supply module present or no AC input.<br>• Green—Power supply module present, on, and good.<br>• Amber—Power or fan module off or failed. |
| PS0 | Indicates the state of the power module installed on the left when facing the back panel:<br>• Off—No power supply module present or no AC input.<br>• Green—Power supply module present, on, and good.<br>• Amber—Power or fan module off or failed. |
| HDD1 | N/A<br>• |
| HDD2 | N/A<br>• |

1. The Cisco ASA software does not support the ALARM indicator initially; support will be added at a later date.
2. OIR is not available at this time.

Table 7-3 shows the Ethernet port indicators.

*Table 7-3 Ethernet Port Indicators*

| Indicator | Description |
|---|---|
| Gigabit Ethernet (RJ45) | • Left side:<br>– Green—Physical activity<br>– Flashing green—Network activity<br>• Right side:<br>– Not lit—10 Mbps<br>– Green—100 Mbps<br>– Amber—1000 Mbps |
| 10-Gigabit Ethernet Fiber (SFP+)/1-Gigabit Ethernet Fiber (SFP) | • Left side:<br>– Off—No 10-Gigabit Ethernet physical link<br>– Green—10-Gigabit Ethernet physical link<br>– Flashing green[1]—Network activity<br>• Right side:<br>– Off—No 1-Gigabit Ethernet physical link<br>– Green—1-Gigabit Ethernet physical link<br>– Flashing green[1]—Network activity |
| Management port | • Right side:<br>– Green—Link to network<br>• Left side<br>– Flashing green—Linked with activity on the network |

1. Flashing green is in proportion to the percentage of number of packets or bytes received.

# Memory Requirements

The ASA-5585-X has up to 6 DIMM modules per CPU. DIMM population is platform-dependent as seen in the following memory configurations:

- ASA 5585-X SSP-10 with IPS SSP-10—12-GB DRAM.
- ASA 5585-X SSP-20 with IPS SSP-20—24-GB DRAM.
- ASA 5585-X SSP-40 with IPS SSP-40—36-GB DRAM.
- ASA 5585-X SSP-60 with IPS SSP-60—72-GB DRAM.

# SFP/SFP+ Modules

The SFP/SFP+ module is a hot-swappable input/output device that plugs into the SFP/SFP+ ports and provides Gigabit Ethernet connectivity. The SFP and SFP+ modules are optional and not included with the ASA 5585-X IPS SSP. You can purchase them separately. For 1 Gb, you need SFP. For 10Gb, you need SFP+. The interfaces are called TenGigabitEthernet 0/*x* whether they are 10 Gb-enabled or not.

Table 7-4 lists the SFP/SFP+ modules that the ASA 5585-X IPS SSP supports.

***Table 7-4 SFP/SFP+ Modules***

| | |
|---|---|
| **1G SFP Module** | |
| GLC-SX-MM | 1000 Base-SX SFP module |
| GLC-SX-MMD | 1000BASE-SX short wavelength, with DOM |
| GLC-LH-SM | 1000 Base-LX/LH SFP module |
| GLC-LH-SMD | 1000BASE-LX/LH long-wavelength, with DOM |
| GLC-T | 1000BASE-T standard |
| **10G SFP+ Module** | |
| SFP-10G-ER | 10G ER SFP+ module |
| SFP-10G-SR | 10G SR SFP+ module |
| SFP-10G-LRM | 10G LRM SFP+ module |
| SFP-10G-LR | 10G LR SFP+ module |
| SFP-H10GB-ACU7M | 10GBASE-CU SFP+ Cable 7 Meter, active |
| SFP-H10GB-ACU10M | 10GBASE-CU SFP+ Cable 10 Meter, active |
| SFP-H10GB-CU1M | 10GBASE-CU SFP+ cable 1 meter, passive |
| SFP-H10GB-CU3M | 10GBASE-CU SFP+ cable 3 meter, passive |
| SFP-H10GB-CU5M | 10GBASE-CU SFP+ cable 5 meter, passive |

# Installing the ASA 5585-X IPS SSP

The ASA 5585-X comes with a core SSP already installed (SSP-10, SSP-20, SSP-40, or SSP-60). You can install an optional ASA 5585-X IPS SSP (IPS SSP-10, IPS SSP-20, IPS SSP-40, or IPS SSP-60).

**Note** The ASA 5585-X IPS SSP must be at the same level as the ASA 5585-X SSP model; for example, if you have the ASA 5585-X with SSP-10, you can only install the IPS SSP-10.

The ASA 5585-X IPS SSP will not run without the core SSP installed. You must install the ASA 5585-X IPS SSP in the upper slot (slot 1) and the core SSP in the bottom slot (slot 0). You must power off the ASA 5585-X to remove and install SSPs. The SSPs are not hot-swappable.

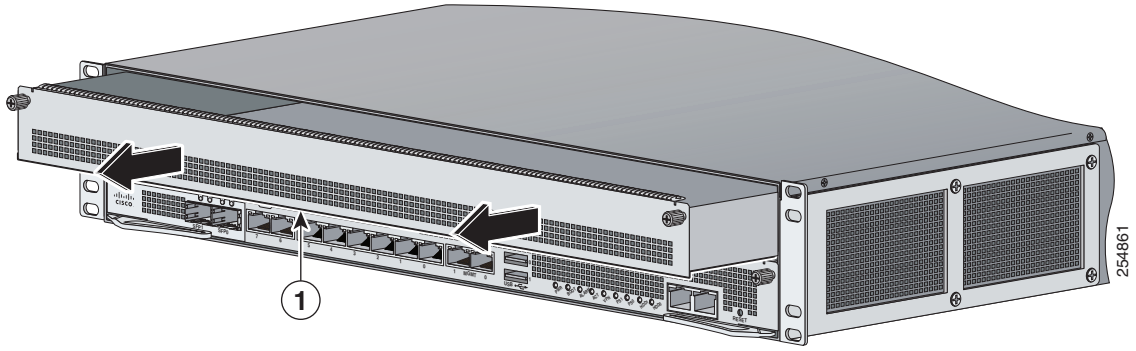
To install the ASA 5585-X IPS SSP in the ASA 5585-X for the first time, follow these steps:

**Step 1** Power off the ASA 5585-X.

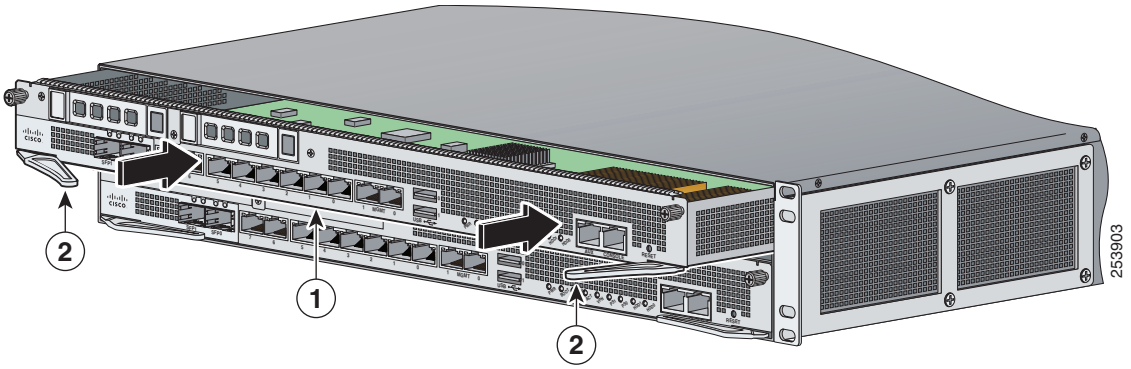
**Step 2** Remove the power cable from the ASA 5585-X.

**Step 3** From the front panel of the ASA 5585-X, loosen the captive screws on the upper left and right of the slot tray (slot 1), and remove it. Store it in a safe place for future use.

**Note** You must install slot trays in all empty slots to maintain the proper air flow. This prevents EMI, which can disrupt other equipment.




**Step 4** Install the ASA 5585-X IPS SSP by lining it up with the module slot making sure the ejection levers are extended.




| | | | |
|---|---|---|---|
| **1** | ASA 5585-X IPS SSP | **2** | Ejection levers |

**Step 5** Slide the ASA 5585-X IPS SSP in to the slot until it is seated and push the ejection levers back in to place.

**Step 6** Tighten the screws.

**Step 7** Reconnect the power cable to the ASA 5585-X.

**Step 8** Power on the ASA 5585-X.

**Step 9** Verify that the PWR indicator on the front panel is green. You can also verify that the ASA 5585-X IPS SSP is online using the **show module 1** command.

**Step 10** Initialize the ASA 5585-X IPS SSP.

**Step 11** Configure the ASA 5585-X IPS SSP to receive IPS traffic.

### For More Information

- For more information about ESD, see Preventing Electrostatic Discharge Damage, page 2-3.
- For the procedure for verifying that the ASA 5585-X IPS SSP is properly installed, see Verifying the Status of the ASA 5585-X IPS SSP, page 7-12.
- For the procedure for using the **setup** command to initialize the ASA 5585-X IPS SSP, see Appendix B, "Initializing the Sensor."
- For the procedure for configuring the ASA 5585-X IPS SSP to receive IPS traffic, refer to Configuring the ASA 5585-X IPS SSP.
- For detailed information about the ASA 5585-X, refer to *Cisco ASA 5585-X Adaptive Security Appliance Hardware Installation Guide*.

# Installing SFP/SFP+ Modules

The IPS SSP-10 and IPS SSP-20 have two SFP/SFP+ ports. The IPS SSP-40 and IPS SSP-60 have four SFP/SFP+ ports. If you are using the fiber ports, you need an SFP+ module for 10-Gigabit Ethernet (a license may be required) or an SFP module for 1-Gigabit Ethernet (SFP or SFP+ modules are not included).

**Note** Make sure the ASA software version that is installed on your ASA 5585-X supports the network module. Refer to the Release Notes for your ASA software version to verify that the network module is supported.

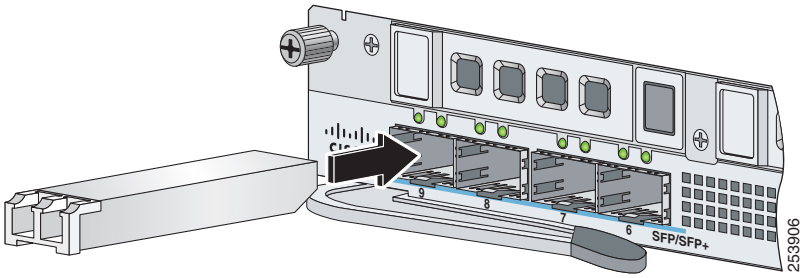
**Note** Only SFP/SFP+ modules certified by Cisco are supported on the adaptive security appliance 5585-X.

**Caution** Protect your SFP/SFP+ modules by inserting clean dust plugs into the SFP/SFP+ modules after the cables are extracted from them. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical bores of another SFP/SFP+ module. Avoid getting dust and other contaminants into the optical bores of your SFP/SFP+ modules. The optics do not operate correctly when obstructed with dust.

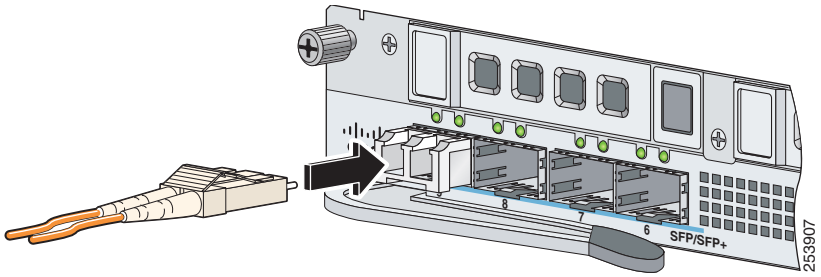
**Warning** **Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures. Statement 70**

To connect to the SFP/SFP+ port if you are using fiber ports, follow these steps:

**Step 1** Install the SFP/SFP+ module.




**Step 2** Connect one end of the LC cable to the SFP/SFP+.




**Step 3** Connect the other end of the LC cable to a network device, such as a router or switch.

### For More Information

For a table listing the supported SFP/SFP+ modules, see SFP/SFP+ Modules, page 7-9.

# Verifying the Status of the ASA 5585-X IPS SSP

You can use the **show module 1** command to verify that the ASA 5585-X IPS SSP is up and running.

The following values are valid for the Status field:

- `Initializing`—The ASA 5585-X IPS SSP is being detected and the control communication is being initialized by the system.
- `Up`—The ASA 5585-X IPS SSP has completed initialization by the system.
- `Unresponsive`—The system encountered an error communicating with the ASA 5585-X IPS SSP.
- `Reloading`—The ASA 5585-X IPS SSP is reloading.
- `Shutting Down`—The ASA 5585-X IPS SSP is shutting down.
- `Down`—The ASA 5585-X IPS SSP is shut down.
- `Recover`—The ASA 5585-X IPS SSP is attempting to download a recovery image.

To verify the status of the ASA 5585-X IPS SSP, follow these steps:

**Step 1** Log in to the adaptive security appliance.

**Step 2** Verify the status of the ASA 5585-X IPS SSP:

```
asa# show module 1

Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
  1 ASA 5585-X IPS Security Services Processor-2 ASA5585-SSP-IPS20  ABC1234D56E

Mod MAC Address Range                 Hw Version   Fw Version   Sw Version
--- --------------------------------- ------------ ------------ ---------------
  1 0001.0001.0001 to 0001.0001.000c  1.0          2.0(7)0      7.1(3)E4

Mod SSM Application Name           Status           SSM Application Version
--- ------------------------------ ---------------- --------------------------
  1 IPS                            Up               7.1(3)E4

Mod Status             Data Plane Status     Compatibility
--- ------------------ --------------------- -------------
  1 Up                 Up
```

If the status reads `Up`, the ASA 5585-X IPS SSP has been properly installed.

# Removing and Replacing the ASA 5585-X IPS SSP

To remove and replace the ASA 5585-X IPS SSP in the ASA 5585-X, follow these steps:

**Step 1** Shut down the ASA 5585-X IPS SSP.

```
asa# hw-module module 1 shutdown
Shutdown module in slot 1? [confirm]
```

**Step 2** Press **Enter** to confirm.

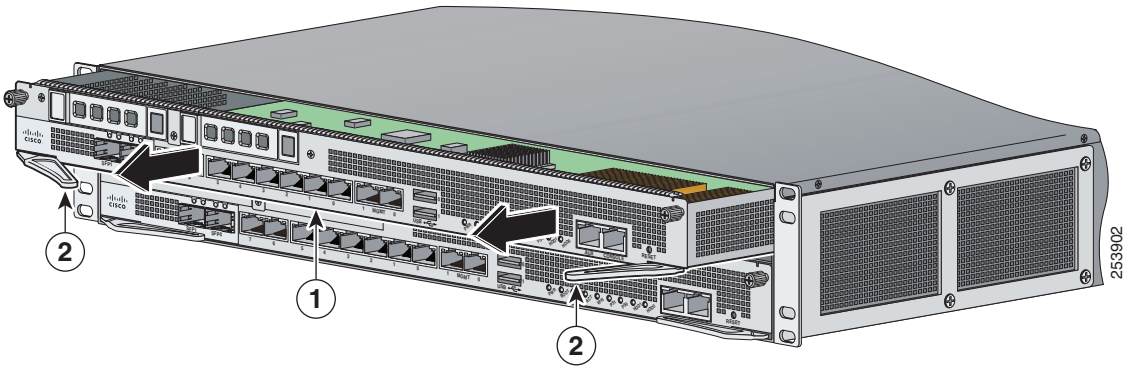
**Step 3** Verify that the ASA 5585-X IPS SSP is shut down by checking the indicators.

**Step 4** Power off the ASA 5585-X.

**Step 5** Remove the power cable from the ASA 5585-X.

**Step 6** From the front panel of the ASA 5585-X, loosen the captive screws on the upper left and right of the ASA 5585-X IPS SSP in slot 1.

**Step 7** Grasp the ejection levers at the left and right bottom of the module slot and pull them out.

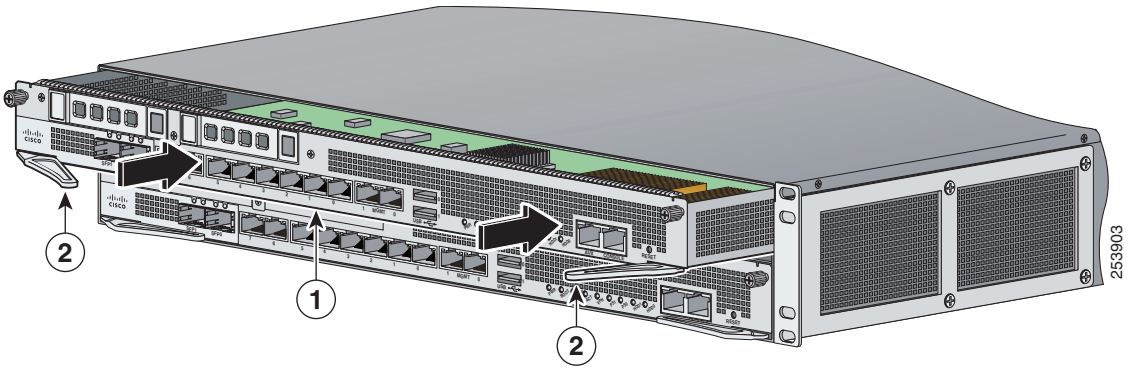



| | | | |
|---|---|---|---|
| **1** | ASA 5585-X IPS SSP | **2** | Ejection levers |

**Step 8** Grasp the sides of the ASA 5585-X IPS SSP and pull it all the way out of the chassis and set it aside.

**Note** If you are not replacing the ASA 5585-X IPS SSP immediately, install the blank slot tray. You must install slot trays in all empty slots to maintain the proper air flow. This prevents EMI, which can disrupt other equipment.

**Step 9** If you are replacing the ASA 5585-X IPS SSP, install it by lining it up with the module slot making sure the ejection levers are extended.




| | | | |
|---|---|---|---|
| **1** | ASA 5585-X IPS SSP | **2** | Ejection levers |

**Note** The ASA 5585-X IPS SSP must be at the same level as the ASA 5585-X SSP model; for example, if you have the ASA 5585-X SSP-10, you can only install the ASA 5585-X IPS SSP-10.

**Step 10** Slide the ASA 5585-X IPS SSP in to the slot until it is seated, and push the ejection levers back in to place.

**Step 11** Replace the screws.

**Step 12** Reconnect the power cable to the ASA 5585-X.

**Step 13** Power on the ASA 5585-X.

**Step 14** Verify that the PWR indicator on the front panel is green. You can also verify that the ASA 5585-X IPS SSP is online using the **show module 1** command.

### For More Information

- For the procedure for using the **show module 1** command, see Verifying the Status of the ASA 5585-X IPS SSP, page 7-12.
- For detailed information about the ASA 5585-X, refer to *Cisco ASA 5585-X Adaptive Security Appliance Hardware Installation Guide*.

# Logging In to the Sensor

## Contents

This chapter explains how to log in to the sensor. All IPS platforms allow ten concurrent log in sessions. It contains the following sections:


- Supported User Roles, page A-1
- Logging In to the Appliance, page A-2
- Connecting an Appliance to a Terminal Server, page A-3
- Logging In to the ASA 5500-X IPS SSP, page A-5
- Logging In to the ASA 5585-X IPS SSP, page A-6
- Logging In to the Sensor, page A-7


## Supported User Roles

You can log in with the following user privileges:

- Administrator
- Operator
- Viewer
- Service

The service role does not have direct access to the CLI. Service account users are logged directly into a bash shell. Use this account for support and troubleshooting purposes only. Unauthorized modifications are not supported and will require the sensor to be reimaged to guarantee proper operation. You can create only one user with the service role.

When you log in to the service account, you receive the following warning:

```
****************************** WARNING ****************************************
UNAUTHORIZED ACCESS TO THIS NETWORK DEVICE IS PROHIBITED.
This account is intended to be used for support and troubleshooting purposes only.
Unauthorized modifications are not supported and will require this device to be re-imaged
to guarantee proper operation.
*******************************************************************************
```

**Note** The service role is a special role that allows you to bypass the CLI if needed. Only a user with administrator privileges can edit the service account.

### For More Information

For the procedure for creating the service account, refer to Creating the Service Account, page E-5.

# Logging In to the Appliance

**Note** You can log in to the appliance from a console port. The currently supported Cisco IPS appliances are the IPS 4240, IPS 4255, and IPS 4260 [IPS 7.0(x) and later and IPS 7.1(5) and later], IPS 4270-20 [IPS 7.1(3) and later], IPS 4345 and IPS 4360 [IPS 7.1(3) and later], and IPS 4510 and IPS 4520 [IPS 7.1(4) and later].

To log in to the appliance, follow these steps:

**Step 1** Connect a console port to the sensor to log in to the appliance.

**Step 2** Enter your username and password at the login prompt.

**Note** The default username and password are both **cisco**. You are prompted to change them the first time you log in to the appliance.You must first enter the UNIX password, which is **cisco**. Then you must enter the new password twice.

```
login: cisco
Password:
***NOTICE***
This product contains cryptographic features and is subject to United States and local
country laws governing import, export, transfer and use. Delivery of Cisco cryptographic
products does not imply third-party authority to import, export, distribute or use
encryption. Importers, exporters, distributors and users are responsible for compliance
with U.S. and local country laws. By using this product you agree to comply with
applicable laws and regulations. If you are unable to comply with U.S. and local laws,
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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

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sensor#
```

### For More Information

- For the procedure for connecting an appliance to a terminal server, see Connecting an Appliance to a Terminal Server, page A-3.
- For the procedure for using the **setup** command to initialize the appliance, see Appendix B, "Initializing the Sensor."

# Connecting an Appliance to a Terminal Server

A terminal server is a router with multiple, low speed, asynchronous ports that are connected to other serial devices. You can use terminal servers to remotely manage network equipment, including appliances. To set up a Cisco terminal server with RJ-45 or hydra cable assembly connections, follow these steps:

**Step 1** Connect to a terminal server using one of the following methods:

- For terminal servers with RJ-45 connections, connect a rollover cable from the console port on the appliance to a port on the terminal server.
- For hydra cable assemblies, connect a straight-through patch cable from the console port on the appliance to a port on the terminal server.

**Step 2** Configure the line and port on the terminal server. In enable mode, enter the following configuration, where # is the line number of the port to be configured.

```
config t
line #
login
transport input all
stopbits 1
flowcontrol hardware
speed 9600
exit
exit
wr mem
```

**Step 3** Be sure to properly close a terminal session to avoid unauthorized access to the appliance. If a terminal session is not stopped properly, that is, if it does not receive an exit(0) signal from the application that initiated the session, the terminal session can remain open. When terminal sessions are not stopped properly, authentication is not performed on the next session that is opened on the serial port.

**Caution** Always exit your session and return to a login prompt before terminating the application used to establish the connection.

**Caution** If a connection is dropped or terminated by accident, you should reestablish the connection and exit normally to prevent unauthorized access to the appliance.

# Logging In to the ASA 5500 AIP SSP

You log in to the ASA 5500 AIP SSM from the adaptive security appliance.

To session in to the ASA 5500 AIP SSM from the adaptive security appliance, follow these steps:

**Step 1** Log in to the adaptive security appliance.

**Note** If the adaptive security appliance is operating in multi-mode, use the **change system** command to get to the system level prompt before continuing.

**Step 2** Session to the ASA 5500 AIP SSM. You have 60 seconds to log in before the session times out.

```
asa# session 1
Opening command session with slot 1.
Connected to slot 1. Escape character sequence is 'CTRL-^X'.
```

**Step 3** Enter your username and password at the login prompt.

**Note** The default username and password are both **cisco**. You are prompted to change them the first time you log in to the module. You must first enter the UNIX password, which is **cisco**. Then you must enter the new password twice.

```
login: cisco
Password:
***NOTICE***
This product contains cryptographic features and is subject to United States and local
country laws governing import, export, transfer and use. Delivery of Cisco cryptographic
products does not imply third-party authority to import, export, distribute or use
encryption. Importers, exporters, distributors and users are responsible for compliance
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Please go to http://www.cisco.com/go/license to obtain a new license or install a license.
aip-ssm#
```

**Step 4** To escape from a session and return to the adaptive security appliance prompt, do one of the following:

- Enter **exit**.
- Press **CTRL-Shift-6-x** (represented as **CTRL^X**).

### For More Information

For the procedure for using the **setup** command to initialize the ASA 5500 AIP SSM, see Advanced Setup for the ASA 5500 AIP SSM, page B-13.

# Logging In to the ASA 5500-X IPS SSP

You log in to the ASA 5500-X IPS SSP from the adaptive security appliance.

To session in to the ASA 5500-X IPS SSP from the adaptive security appliance, follow these steps:

**Step 1** Log in to the adaptive security appliance.

**Note** If the adaptive security appliance is operating in multi-mode, use the **change system** command to get to the system level prompt before continuing.

**Step 2** Session to the IPS. You have 60 seconds to log in before the session times out.

```
asa# session ips
Opening command session with slot 1.
Connected to slot 1. Escape character sequence is 'CTRL-^X'.
```

**Step 3** Enter your username and password at the login prompt.

**Note** The default username and password are both **cisco**. You are prompted to change them the first time you log in to the module. You must first enter the UNIX password, which is **cisco**. Then you must enter the new password twice.

```
login: cisco
Password:
***NOTICE***
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products does not imply third-party authority to import, export, distribute or use
encryption. Importers, exporters, distributors and users are responsible for compliance
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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

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There is no license key installed on this IPS platform.
The system will continue to operate with the currently installed
signature set. A valid license must be obtained in order to apply
signature updates. Please go to http://www.cisco.com/go/license
to obtain a new license or install a license.

asa-ips#
```

**Step 4** To escape from a session and return to the adaptive security appliance prompt, do one of the following:

- Enter **exit**.
- Press **CTRL-Shift-6-x** (represented as **CTRL^X**).

### For More Information

For the procedure for using the **setup** command to initialize the ASA 5500-X IPS SSP, see Advanced Setup for the ASA 5500-X IPS SSP, page B-17

# Logging In to the ASA 5585-X IPS SSP

You log in to the ASA 5585-X IPS SSP from the adaptive security appliance.

To session in to the ASA 5585-X IPS SSP from the adaptive security appliance, follow these steps:

**Step 1** Log in to the adaptive security appliance.

**Note** If the adaptive security appliance is operating in multi-mode, use the **change system** command to get to the system level prompt before continuing.

**Step 2** Session to the ASA 5585-X IPS SSP. You have 60 seconds to log in before the session times out.

```
asa# session 1
Opening command session with slot 1.
Connected to slot 1. Escape character sequence is 'CTRL-^X'.
```

**Step 3** Enter your username and password at the login prompt.

**Note** The default username and password are both **cisco**. You are prompted to change them the first time you log in to the module. You must first enter the UNIX password, which is **cisco**. Then you must enter the new password twice.

```
login: cisco
Password:
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encryption. Importers, exporters, distributors and users are responsible for compliance
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applicable laws and regulations. If you are unable to comply with U.S. and local laws,
return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.

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Please go to http://www.cisco.com/go/license to obtain a new license or install a license.
ips-ssp#
```

**Step 4** To escape from a session and return to the adaptive security appliance prompt, do one of the following:

- Enter **exit**.
- Press **CTRL-Shift-6-x** (represented as **CTRL^X**).

### For More Information

For the procedure for initializing the ASA 5585-X IPS SSP using the **setup** command, see Advanced Setup for the ASA 5585-X IPS SSP, page B-21.

# Logging In to the Sensor

**Note** After you have initialized the sensor using the **setup** command and enabled Telnet, you can use SSH or Telnet to log in to the sensor.

To log in to the sensor using Telnet or SSH, follow these steps:

**Step 1** To log in to the sensor over the network using SSH or Telnet.

```
ssh sensor_ip_address
telnet sensor_ip_address
```

**Step 2** Enter your username and password at the login prompt.

```
login: ******
Password: ******
***NOTICE***
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encryption. Importers, exporters, distributors and users are responsible for compliance
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return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

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sensor#
```

# Initializing the Sensor

## Contents

This chapter describes how to use the **setup** command to initialize the sensor, and contains the following sections:


- Understanding Initialization, page B-1
- Simplified Setup Mode, page B-2
- System Configuration Dialog, page B-2
- Basic Sensor Setup, page B-4
- Advanced Setup, page B-7
- Verifying Initialization, page B-25


## Understanding Initialization

After you install the sensor on your network, you must use the **setup** command to initialize it so that you can communicate with it over the network. You cannot use the IDM or the IME to configure the sensor until you initialize the sensor using the **setup** command.

With the **setup** command, you configure basic sensor settings, including the hostname, IP interfaces, access control lists, global correlation servers, and time settings. You can continue using advanced setup in the CLI to enable Telnet, configure the web server, and assign and enable virtual sensors and interfaces, or you can use the Startup Wizard in the IDM or the IME. After you configure the sensor with the **setup** command, you can change the network settings in the IDM or the IME.

**Note** You must be administrator to use the **setup** command.

# Simplified Setup Mode

The sensor automatically calls the **setup** command when you connect to the sensor using a console cable and the sensor basic network settings have not yet been configured. The sensor does not call automatic setup under the following conditions:

- When initialization has already been successfully completed.
- If you have recovered or downgraded the sensor.
- If you have set the host configuration to default after successfully configuring the sensor using automatic setup.

When you enter the **setup** command, an interactive dialog called the System Configuration Dialog appears on the system console screen. The System Configuration Dialog guides you through the configuration process. The values shown in brackets next to each prompt are the default values last set.

# System Configuration Dialog

When you enter the **setup** command, an interactive dialog called the System Configuration Dialog appears on the system console screen. The System Configuration Dialog guides you through the configuration process. The values shown in brackets next to each prompt are the current values.

You must go through the entire System Configuration Dialog until you come to the option that you want to change. To accept default settings for items that you do not want to change, press **Enter**.

To return to the EXEC prompt without making changes and without going through the entire System Configuration Dialog, press **Ctrl-C**. The System Configuration Dialog also provides help text for each prompt. To access the help text, enter **?** at a prompt.

When you complete your changes, the System Configuration Dialog shows you the configuration that you created during the setup session. It also asks you if you want to use this configuration. If you enter **yes**, the configuration is saved. If you enter **no**, the configuration is not saved and the process begins again. There is no default for this prompt; you must enter either **yes** or **no**.

You can configure daylight savings time either in recurring mode or date mode. If you choose recurring mode, the start and end days are based on week, day, month, and time. If you choose date mode, the start and end days are based on month, day, year, and time. Choosing disable turns off daylight savings time.

**Note** You only need to set the date and time in the System Configuration Dialog if the system is an appliance and is NOT using NTP.

**Note** The System Configuration Dialog is an interactive dialog. The default settings are displayed.

Example B-1 shows a sample System Configuration Dialog.

***Example B-1 Example System Configuration Dialog***

```
    --- Basic Setup ---

    --- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
User ctrl-c to abort configuration dialog at any prompt.
```

```
Default settings are in square brackets '[]'.



Current time: Wed Nov 11 21:19:51 2009

Setup Configuration last modified:

Enter host name[sensor]:
Enter IP interface[192.168.1.2/24,192.168.1.1]:
Modify current access list?[no]:
Current access list entries:
  [1] 0.0.0.0/0
Delete:
Permit:
Use DNS server for Global Correlation?[no]:
  DNS server IP address[171.68.226.120]:
Use HTTP proxy server for Global Correlation?[no]:
  HTTP proxy server IP address[128.107.241.169]:
  HTTP proxy server Port number[8080]:
Modify system clock settings?[no]:
  Modify summer time settings?[no]:
    Use USA SummerTime Defaults?[yes]:
    Recurring, Date or Disable?[Recurring]:
    Start Month[march]:
    Start Week[second]:
    Start Day[sunday]:
    Start Time[02:00:00]:
    End Month[november]:
    End Week[first]:
    End Day[sunday]:
    End Time[02:00:00]:
    DST Zone[]:
    Offset[60]:
  Modify system timezone?[no]:
    Timezone[UTC]:
    UTC Offset[0]:
  Use NTP?[no]: yes
    NTP Server IP Address[]:
    Use NTP Authentication?[no]: yes
      NTP Key ID[]: 1
      NTP Key Value[]: 8675309
Participation in the SensorBase Network allows Cisco to collect aggregated statistics
about traffic sent to your IPS.
SensorBase Network Participation level?[off]: full

If you agree to participate in the SensorBase Network, Cisco will collect aggregated
statistics about traffic sent to your IPS.
This includes summary data on the Cisco IPS network traffic properties and how this
traffic was handled by the Cisco appliances. We do not collect the data content of traffic
or other sensitive business or personal information. All data is aggregated and sent via
secure HTTP to the Cisco SensorBase Network servers in periodic intervals. All data shared
with Cisco will be anonymous and treated as strictly confidential.
The table below describes how the data will be used by Cisco.
Participation Level = "Partial":
  * Type of Data: Protocol Attributes (e.g. TCP max segment size and
    options string)
    Purpose: Track potential threats and understand threat exposure
  * Type of Data: Attack Type (e.g. Signature Fired and Risk Rating)
    Purpose: Used to understand current attacks and attack severity
  * Type of Data: Connecting IP Address and port
    Purpose: Identifies attack source
  * Type of Data: Summary IPS performance (CPU utilization memory usage,
    inline vs. promiscuous, etc)
```

```
    Purpose: Tracks product efficacy
Participation Level = "Full" additionally includes:
  * Type of Data: Victim IP Address and port
    Purpose: Detect threat behavioral patterns

Do you agree to participate in the SensorBase Network?[no]:
```

### For More Information

For detailed information on the global correlationfeatures, for the IDM refer to Configuring Global Correlation, for the IME refer to Configuring Global Correlation, and for the CLI, refer to Configuring Global Correlation.

# Basic Sensor Setup

You can perform basic sensor setup using the **setup** command, and then finish setting up the sensor using the CLI, the IDM, or the IME.

You can perform basic sensor setup using the **setup** command, and then finish setting up the sensor using the CLI, IDM, or IME. To perform basic sensor setup using the **setup** command, follow these steps:

**Step 1** Log in to the sensor using an account with administrator privileges.

**Note** Both the default username and password are **cisco**.

**Step 2** The first time you log in to the sensor you are prompted to change the default password. Passwords must be at least eight characters long and be strong, that is, not be a dictionary word. After you change the password, basic setup begins.

**Step 3** Enter the **setup** command. The System Configuration Dialog is displayed.

**Step 4** Specify the hostname. The hostname is a case-sensitive character string up to 64 characters. Numbers, "_" and "-" are valid, but spaces are not acceptable. The default is sensor.

**Step 5** Specify the IP interface. The IP interface is in the form of IP Address/Netmask,Gateway: *X.X.X.X/nn*,*Y.Y.Y.Y*, where *X.X.X.X* specifies the sensor IP address as a 32-bit address written as 4 octets separated by periods, *nn* specifies the number of bits in the netmask, and *Y.Y.Y.Y* specifies the default gateway as a 32-bit address written as 4 octets separated by periods.

**Step 6** Enter **yes** to modify the network access list:

a. If you want to delete an entry, enter the number of the entry and press **Enter**, or press **Enter** to get to the Permit line.

b. Enter the IP address and netmask of the network you want to add to the access list.

**Note** For example, 10.0.0.0/8 permits all IP addresses on the 10.0.0.0 network (10.0.0.0-10.255.255.255) and 10.1.1.0/24 permits only the IP addresses on the 10.1.1.0 subnet (10.1.1.0-10.1.1.255). If you want to permit access to a single IP address than the entire network, use a 32-bit netmask. For example, 10.1.1.1/32 permits just the 10.1.1.1 address.

c. Repeat Step b until you have added all networks that you want to add to the access list, and then press **Enter** at a blank permit line to go to the next step.

**Step 7** You must configure a DNS server or an HTTP proxy server for global correlation to operate:

a. Enter **yes** to add a DNS server, and then enter the DNS server IP address.

b. Enter **yes** to add an HTTP proxy server, and then enter the HTTP proxy server IP address and port number.

**Caution** You must have a valid sensor license for global correlation features to function. You can still configure and display statistics for the global correlation features, but the global correlation databases are cleared and no updates are attempted. Once you install a valid license, the global correlation features are reactivated.

**Step 8** Enter **yes** to modify the system clock settings:

a. Enter **yes** to modify summertime settings.

**Note** Summertime is also known as DST. If your location does not use Summertime, go to Step m.

b. Enter **yes** to choose the USA summertime defaults, or enter **no** and choose recurring, date, or disable to specify how you want to configure summertime settings. The default is recurring.

c. If you chose recurring, specify the month you want to start summertime settings. Valid entries are january, february, march, april, may, june, july, august, september, october, november, and december. The default is march.

d. Specify the week you want to start summertime settings. Valid entries are first, second, third, fourth, fifth, and last. The default is second.

e. Specify the day you want to start summertime settings. Valid entries are sunday, monday, tuesday, wednesday, thursday, friday, and saturday. The default is sunday.

f. Specify the time you want to start summertime settings. The default is 02:00:00.

**Note** The default recurring summertime parameters are correct for time zones in the United States. The default values specify a start time of 2:00 a.m. on the second Sunday in March, and a stop time of 2:00 a.m. on the first Sunday in November. The default summertime offset is 60 minutes.

g. Specify the month you want summertime settings to end. Valid entries are january, february, march, april, may, june, july, august, september, october, november, and december. The default is november.

h. Specify the week you want the summertime settings to end. Valid entries are first, second, third, fourth, fifth, and last. The default is first.

i. Specify the day you want the summertime settings to end. Valid entries are sunday, monday, tuesday, wednesday, thursday, friday, and saturday. The default is sunday.

j. Specify the time you want summertime settings to end. The default is 02:00:00.

k. Specify the DST zone. The zone name is a character string up to 24 characters long in the pattern [A-Za-z0-9()+:,_/-]+$.

l. Specify the summertime offset. Specify the summertime offset from UTC in minutes (negative numbers represent time zones west of the Prime Meridian). The default is 60.

m. Enter **yes** to modify the system time zone.

n. Specify the standard time zone name. The zone name is a character string up to 24 characters long.

o. Specify the standard time zone offset. Specify the standard time zone offset from UTC in minutes (negative numbers represent time zones west of the Prime Meridian). The default is 0.

p. Enter **yes** if you want to use NTP. To use authenticated NTP, you need the NTP server IP address, the NTP key ID, and the NTP key value. If you do not have those at this time, you can configure NTP later. Otherwise, you can choose unauthenticated NTP.

**Step 9** Enter **off**, **partial**, or **full** to participate in the SensorBase Network Participation:

- Off—No data is contributed to the SensorBase Network.
- Partial—Data is contributed to the SensorBase Network, but data considered potentially sensitive is filtered out and never sent.
- Full—All data is contributed to the SensorBase Network except the attacker/victim IP addresses that you exclude.

The SensorBase Network Participation disclaimer appears. It explains what is involved in participating in the SensorBase Network.

**Step 10** Enter **yes** to participate in the SensorBase Network.

```
The following configuration was entered.
service host
network-settings
host-ip 192.168.1.2/24, 192.168.1.1
host-name sensor
telnet-option disabled
sshv1-fallback enabled
access-list 10.0.0.0/8
ftp-timeout 300
no login-banner-text
dns-primary-server enabled
address 171.68.226.120
exit
dns-secondary-server disabled
dns-tertiary-server disabled
http-proxy proxy-server
address 128.107.241.170
port 8080
exit
time-zone-settings
offset -360
standard-time-zone-name CST
exit
summertime-option recurring
offset 60
summertime-zone-name CDT
start-summertime
month march
week-of-month second
day-of-week sunday
time-of-day 02:00:00
exit
end-summertime
month november
week-of-month first
day-of-week sunday
time-of-day 02:00:00
exit
exit
ntp-option enabled
ntp-keys 1 md5-key 8675309
ntp-servers 10.10.1.2 key-id 1
exit
```

```
service global-correlation
network-participation full
exit


[0] Go to the command prompt without saving this config.
[1] Return to setup without saving this config.
[2] Save this configuration and exit setup.
[3] Continue to Advanced setup.
```

**Step 11** Enter **2** to save the configuration (or **3** to continue with advanced setup using the CLI).

```
Enter your selection[2]: 2
Configuration Saved.
```

**Step 12** If you changed the time setting, enter **yes** to reboot the sensor.

---

**For More Information**

- For the procedure for obtaining the most recent IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.
- For the procedures for configuring intrusion prevention on your sensor, refer to the following guides:
  - *Cisco Intrusion Prevention System Device Manager Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Manager Express Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Sensor CLI Configuration Guide for IPS 7.1*

# Advanced Setup

This section describes how to continue with Advanced Setup in the CLI for the various Cisco IPS platforms. It contains the following sections:

- Advanced Setup for the Appliance, page B-7
- Advanced Setup for the ASA 5500 AIP SSM, page B-13
- Advanced Setup for the ASA 5500-X IPS SSP, page B-17
- Advanced Setup for the ASA 5585-X IPS SSP, page B-21

## Advanced Setup for the Appliance

**Note** The currently supported Cisco IPS appliances are the IPS 4240, IPS 4255, and IPS 4260 [IPS 7.0(x) and later and IPS 7.1(5) and later], IPS 4270-20 [IPS 7.1(3) and later], IPS 4345 and IPS 4360 [IPS 7.1(3) and later], and IPS 4510 and IPS 4520 [IPS 7.1(4) and later].

**Note** Adding new subinterfaces is a two-step process. You first organize the interfaces when you edit the virtual sensor configuration. You then choose which interfaces and subinterfaces are assigned to which virtual sensors.

The interfaces change according to the appliance model, but the prompts are the same for all models. To continue with advanced setup for the appliance, follow these steps:

**Step 1** Log in to the appliance using an account with administrator privileges.

**Step 2** Enter the **setup** command. The System Configuration Dialog is displayed. Press **Enter** or the spacebar to skip to the menu to access advanced setup.

**Step 3** Enter **3** to access advanced setup.

**Step 4** Specify the Telnet server status. The default is disabled.

**Step 5** Specify the SSHv1 fallback setting. The default is enabled.

**Step 6** Specify the web server port. The web server port is the TCP port used by the web server (1 to 65535). The default is 443.

**Note** The web server is configured to use TLS/SSL encryption by default. Setting the port to 80 does not disable the encryption.

**Step 7** Enter **yes** to modify the interface and virtual sensor configuration and to see the current interface configuration.

```
Current interface configuration
 Command control: Management0/0
 Unassigned:
  Promiscuous:
   GigabitEthernet0/0
   GigabitEthernet0/1
   GigabitEthernet0/2
   GigabitEthernet0/3

 Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

 Virtual Sensor: vs1
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

 Virtual Sensor: vs2
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 8** Enter **1** to edit the interface configuration.

**Note** The following options let you create and delete interfaces. You assign the interfaces to virtual sensors in the virtual sensor configuration. If you are using promiscuous mode for your interfaces and are not subdividing them by VLAN, no additional configuration is necessary.

```
[1] Remove interface configurations.
```

```
  [2] Add/Modify Inline Vlan Pairs.
  [3] Add/Modify Promiscuous Vlan Groups.
  [4] Add/Modify Inline Interface Pairs.
  [5] Add/Modify Inline Interface Pair Vlan Groups.
  [6] Modify interface default-vlan.
Option:
```

**Step 9** Enter **2** to add inline VLAN pairs and display the list of available interfaces.

**Caution** The new VLAN pair is not automatically added to a virtual sensor.

```
Available Interfaces
  [1] GigabitEthernet0/0
  [2] GigabitEthernet0/1
  [3] GigabitEthernet0/2
  [4] GigabitEthernet0/3
Option:
```

**Step 10** Enter **1** to add an inline VLAN pair to GigabitEthernet 0/0, for example.

```
Inline Vlan Pairs for GigabitEthernet0/0
   None
```

**Step 11** Enter a subinterface number and description.

```
Subinterface Number:
Description[Created via setup by user asmith]:
```

**Step 12** Enter numbers for VLAN 1 and 2.

```
Vlan1[]: 200
Vlan2[]: 300
```

**Step 13** Press **Enter** to return to the available interfaces menu.

**Note** Entering a carriage return at a prompt without a value returns you to the previous menu.

```
  [1] GigabitEthernet0/0
  [2] GigabitEthernet0/1
  [3] GigabitEthernet0/2
  [4] GigabitEthernet0/3
Option:
```

**Note** At this point, you can configure another interface, for example, GigabitEthernet 0/1, for inline VLAN pair.

**Step 14** Press **Enter** to return to the top-level interface editing menu.

```
[1] Remove interface configurations.
  [2] Add/Modify Inline Vlan Pairs.
  [3] Add/Modify Promiscuous Vlan Groups.
  [4] Add/Modify Inline Interface Pairs.
  [5] Add/Modify Inline Interface Pair Vlan Groups.
  [6] Modify interface default-vlan.
Option:
```

**Step 15** Enter **4** to add an inline interface pair and see these options.

```
Available Interfaces
   GigabitEthernet0/1
   GigabitEthernet0/2
   GigabitEthernet0/3
```

**Step 16** Enter the pair name, description, and which interfaces you want to pair.

```
Pair name: newPair
Description[Created via setup by user asmith:
Interface1[]: GigabitEthernet0/1
Interface2[]: GigabitEthernet0/2
Pair name:
```

**Step 17** Press **Enter** to return to the top-level interface editing menu.

```
  [1] Remove interface configurations.
  [2] Add/Modify Inline Vlan Pairs.
  [3] Add/Modify Promiscuous Vlan Groups.
  [4] Add/Modify Inline Interface Pairs.
  [5] Add/Modify Inline Interface Pair Vlan Groups.
  [6] Modify interface default-vlan.
Option:
```

**Step 18** Press **Enter** to return to the top-level editing menu.

```
  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 19** Enter **2** to edit the virtual sensor configuration.

```
  [1] Remove virtual sensor.
  [2] Modify "vs0" virtual sensor configuration.
  [3] Create new virtual sensor.
Option:
```

**Step 20** Enter **2** to modify the virtual sensor configuration, vs0.

```
Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

No Interfaces to remove.

 Unassigned:
  Promiscuous:
   [1] GigabitEthernet0/3
   [2] GigabitEthernet0/0
  Inline Vlan Pair:
   [3] GigabitEthernet0/0:1 (Vlans: 200, 300)
  Inline Interface Pair:
   [4] newPair (GigabitEthernet0/1, GigabitEthernet0/2)
Add Interface:
```

**Step 21** Enter **3** to add inline VLAN pair GigabitEthernet0/0:1.

**Step 22** Enter **4** to add inline interface pair NewPair.

**Step 23** Press **Enter** to return to the top-level virtual sensor menu.

```
Virtual Sensor: vs0
  Anomaly Detection: ad0
```

```
  Event Action Rules: rules0
  Signature Definitions: sig0
  Inline Vlan Pair:
   GigabitEthernet0/0:1 (Vlans: 200, 300)
  Inline Interface Pair:
   newPair (GigabitEthernet0/1, GigabitEthernet0/2)

  [1] Remove virtual sensor.
  [2] Modify "vs0" virtual sensor configuration.
  [3] Create new virtual sensor.
Option: GigabitEthernet0/1, GigabitEthernet0/2)
Add Interface:
```

**Step 24** Press **Enter** to return to the top-level interface and virtual sensor configuration menu.

```
  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 25** Enter **yes** if you want to modify the default threat prevention settings.

**Note** The sensor comes with a built-in override to add the deny packet event action to high risk rating alerts. If you do not want this protection, disable automatic threat prevention.

```
Virtual sensor newVs is configured to prevent high risk threats in inline mode. (Risk
Rating 90-100)
Virtual sensor vs0 is configured to prevent high risk threats in inline mode.(Risk Rating
90-100)
Do you want to disable automatic threat prevention on all virtual sensors?[no]:
```

**Step 26** Enter **yes** to disable automatic threat prevention on all virtual sensors.

**Step 27** Press **Enter** to exit the interface and virtual sensor configuration.

```
The following configuration was entered.
service host
network-settings
host-ip 192.168.1.2/24,192.168.1.1
host-name sensor
telnet-option disabled
sshv1-fallback enabled
ftp-timeout 300
no login-banner-text
exit
time-zone-settings
offset 0
standard-time-zone-name UTC
exit
summertime-option disabled
ntp-option disabled
exit
service web-server
port 342
exit
service interface
physical-interfaces GigabitEthernet0/0
admin-state enabled
subinterface-type inline-vlan-pair
subinterface 1
description Created via setup by user asmith
vlan1 200
```

```
vlan2 300
exit
exit
exit
physical-interfaces GigabitEthernet0/1
admin-state enabled
exit
physical-interfaces GigabitEthernet0/2
admin-state enabled
exit
physical-interfaces GigabitEthernet0/0
admin-state enabled
exit
inline-interfaces newPair
description Created via setup by user asmith
interface1 GigabitEthernet0/1
interface2 GigabitEthernet0/2
exit
exit
service analysis-engine
virtual-sensor newVs
description Created via setup by user cisco
signature-definition newSig
event-action-rules rules0
anomaly-detection
anomaly-detection-name ad0
operational-mode inactive
exit
physical-interface GigabitEthernet0/0
exit
virtual-sensor vs0
physical-interface GigabitEthernet0/0 subinterface-number 1
logical-interface newPair
service event-action-rules rules0
overrides deny-packet-inline
override-item-status Disabled
risk-rating-range 90-100
exit
exit

[0] Go to the command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration and exit setup.
```

**Step 28** Enter **2** to save the configuration.

```
Enter your selection[2]: 2
Configuration Saved.
```

**Step 29** Reboot the appliance.

```
sensor# reset
Warning: Executing this command will stop all applications and reboot the node.
Continue with reset? []:
```

**Step 30** Enter **yes** to continue the reboot.

**Step 31** Apply the most recent service pack and signature update. You are now ready to configure your appliance for intrusion prevention.

### For More Information

- For the procedure for obtaining the most recent IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.
- For the procedures for configuring intrusion prevention on your sensor, refer to the following guides:
  - *Cisco Intrusion Prevention System Device Manager Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Manager Express Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Sensor CLI Configuration Guide for IPS 7.1*

# Advanced Setup for the ASA 5500 AIP SSM

To continue with advanced setup for the ASA 5500 AIP SSM, follow these steps:

**Step 1** Session in to the ASA 5500 AIP SSM using an account with administrator privileges.

```
asa# session 1
```

**Step 2** Enter the **setup** command. The System Configuration Dialog is displayed. Press **Enter** or the spacebar to skip to the menu to access advanced setup.

**Step 3** Enter **3** to access advanced setup.

**Step 4** Specify the Telnet server status. You can disable or enable Telnet services. The default is disabled.

**Step 5** Specify the SSHv1 fallback setting. The default is enabled.

**Step 6** Specify the web server port. The web server port is the TCP port used by the web server (1 to 65535). The default is 443.

**Note** The web server is configured to use TLS/SSL encryption by default. Setting the port to 80 does not disable the encryption.

**Step 7** Enter **yes** to modify the interface and virtual sensor configuration.

```
Current interface configuration
 Command control: Management0/0
 Unassigned:
  Monitored:
   GigabitEthernet0/1

 Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 8** Enter **1** to edit the interface configuration.

**Note** You do not need to configure interfaces on the ASA 5500 AIP SSM. You should ignore the modify interface default VLAN setting. The separation of traffic across virtual sensors is configured differently for the ASA 5500 AIP SSM than for other sensors.

```
  [1] Modify interface default-vlan.
Option:
```

**Step 9** Press **Enter** to return to the top-level interface and virtual sensor configuration menu.

```
  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 10** Enter **2** to edit the virtual sensor configuration.

```
  [1] Remove virtual sensor.
  [2] Modify "vs0" virtual sensor configuration.
  [3] Create new virtual sensor.
Option:
```

**Step 11** Enter **2** to modify the virtual sensor vs0 configuration.

```
Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

No Interfaces to remove.

 Unassigned:
  Monitored:
   [1] GigabitEthernet0/1
Add Interface:
```

**Step 12** Enter **1** to add GigabitEthernet 0/1 to virtual sensor vs0.

**Note** Multiple virtual sensors are supported. The adaptive security appliance can direct packets to specific virtual sensors or can send packets to be monitored by a default virtual sensor. The default virtual sensor is the virtual sensor to which you assign GigabitEthernet 0/1. We recommend that you assign GigabitEthernet 0/1 to vs0, but you can assign it to another virtual sensor if you want to.

**Step 13** Press **Enter** to return to the main virtual sensor menu.

**Step 14** Enter **3** to create a virtual sensor.

```
Name[]:
```

**Step 15** Enter a name and description for your virtual sensor.

```
Name[]: newVs
Description[Created via setup by user cisco]: New Sensor
Anomaly Detection Configuration
  [1] ad0
  [2] Create a new anomaly detection configuration
Option[2]:
```

**Step 16** Enter **1** to use the existing anomaly detection configuration, ad0.

```
Signature Definition Configuration
  [1] sig0
  [2] Create a new signature definition configuration
Option[2]:
```

**Step 17** Enter **2** to create a signature-definition configuration file.

**Step 18** Enter the signature-definition configuration name, **newSig**.

```
Event Action Rules Configuration
  [1] rules0
  [2] Create a new event action rules configuration
Option[2]:
```

**Step 19** Enter **1** to use the existing event-action-rules configuration, rules0.

**Note** If GigabitEthernet 0/1 has not been assigned to vs0, you are prompted to assign it to the new virtual sensor.

```
Virtual Sensor: newVs
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: newSig
  Monitored:
   GigabitEthernet0/1

  [1] Remove virtual sensor.
  [2] Modify "newVs" virtual sensor configuration.
  [3] Modify "vs0" virtual sensor configuration.
  [4] Create new virtual sensor.
Option:
```

**Step 20** Press **Enter** to exit the interface and virtual sensor configuration menu.

```
Modify default threat prevention settings?[no]:
```

**Step 21** Enter **yes** if you want to modify the default threat prevention settings.

**Note** The sensor comes with a built-in override to add the deny packet event action to high risk rating alerts. If you do not want this protection, disable automatic threat prevention.

```
Virtual sensor newVs is configured to prevent high risk threats in inline mode. (Risk
Rating 90-100)
Virtual sensor vs0 is configured to prevent high risk threats in inline mode.(Risk Rating
90-100)
Do you want to disable automatic threat prevention on all virtual sensors?[no]:
```

**Step 22** Enter **yes** to disable automatic threat prevention on all virtual sensors.

```
The following configuration was entered.

service host
network-settings
host-ip 10.1.9.201/24,10.1.9.1
host-name aip-ssm
telnet-option disabled
sshv1-fallback enabled
access-list 10.0.0.0/8
access-list 64.0.0.0/8
```

```
ftp-timeout 300
no login-banner-text
exit
time-zone-settings
offset 0
standard-time-zone-name UTC
exit
summertime-option disabled
ntp-option disabled
exit
service web-server
port 342
exit
service analysis-engine
virtual-sensor newVs
description New Sensor
signature-definition newSig
event-action-rules rules0
anomaly-detection
anomaly-detection-name ad0
exit
physical-interfaces GigabitEthernet0/1
exit
exit
service event-action-rules rules0
overrides deny-packet-inline
override-item-status Disabled
risk-rating-range 90-100
exit
exit

[0] Go to the command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration and exit setup.
```

**Step 23** Enter **2** to save the configuration.

```
Enter your selection[2]: 2
Configuration Saved.
```

**Step 24** Reboot the ASA 5500 AIP SSM.

```
aip-ssm# reset
Warning: Executing this command will stop all applications and reboot the node.
Continue with reset? []:
```

**Step 25** Enter **yes** to continue the reboot.

**Step 26** After reboot, log in to the sensor, and display the self-signed X.509 certificate (needed by TLS).

```
aip-ssm# show tls fingerprint
MD5: C4:BC:F2:92:C2:E2:4D:EB:92:0F:E4:86:53:6A:C6:01
SHA1: 64:9B:AC:DE:21:62:0C:D3:57:2E:9B:E5:3D:04:8F:A7:FD:CD:6F:27
```

**Step 27** Write down the certificate fingerprints. You need the fingerprints to check the authenticity of the certificate when using HTTPS to connect to this ASA 5500 AIP SSM with a web browser.

**Step 28** Apply the most recent service pack and signature update. You are now ready to configure your ASA 5500 AIP SSM for intrusion prevention.

### For More Information

- For the procedure for obtaining the most recent IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.
- For the procedures for configuring intrusion prevention on your sensor, refer to the following guides:
  - *Cisco Intrusion Prevention System Device Manager Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Manager Express Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Sensor CLI Configuration Guide for IPS 7.1*

# Advanced Setup for the ASA 5500-X IPS SSP

To continue with advanced setup for the ASA 5500-X IPS SSP, follow these steps:

**Step 1** Session in to the IPS using an account with administrator privileges.

```
asa# session ips
```

**Step 2** Enter the **setup** command. The System Configuration Dialog is displayed. Press **Enter** or the spacebar to skip to the menu to access advanced setup.

**Step 3** Enter **3** to access advanced setup.

**Step 4** Specify the Telnet server status. You can disable or enable Telnet services. The default is disabled.

**Step 5** Specify the SSHv1 fallback setting. The default is enabled.

**Step 6** Specify the web server port. The web server port is the TCP port used by the web server (1 to 65535). The default is 443.

**Note** The web server is configured to use TLS/SSL encryption by default. Setting the port to 80 does not disable the encryption.

**Step 7** Enter **yes** to modify the interface and virtual sensor configuration.

```
Current interface configuration
 Command control: Management0/0
 Unassigned:
  Monitored:
   PortChannel 0/0

 Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 8** Enter **1** to edit the interface configuration.

**Note** You do not need to configure interfaces on the ASA 5500-X IPS SSP. You should ignore the modify interface default VLAN setting. The separation of traffic across virtual sensors is configured differently for the ASA 5500-X IPS SSP than for other sensors.

```
  [1] Modify interface default-vlan.
Option:
```

**Step 9** Press **Enter** to return to the top-level interface and virtual sensor configuration menu.

```
  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 10** Enter **2** to edit the virtual sensor configuration.

```
  [1] Remove virtual sensor.
  [2] Modify "vs0" virtual sensor configuration.
  [3] Create new virtual sensor.
Option:
```

**Step 11** Enter **2** to modify the virtual sensor vs0 configuration.

```
Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

No Interfaces to remove.

 Unassigned:
  Monitored:
   [1] PortChannel 0/0
Add Interface:
```

**Step 12** Enter **1** to add PortChannel 0/0 to virtual sensor vs0.

**Note** Multiple virtual sensors are supported. The adaptive security appliance can direct packets to specific virtual sensors or can send packets to be monitored by a default virtual sensor. The default virtual sensor is the virtual sensor to which you assign PortChannel 0/0. We recommend that you assign PortChannel 0/0 to vs0, but you can assign it to another virtual sensor if you want to.

**Step 13** Press **Enter** to return to the main virtual sensor menu.

**Step 14** Enter **3** to create a virtual sensor.

```
Name[]:
```

**Step 15** Enter a name and description for your virtual sensor.

```
Name[]: newVs
Description[Created via setup by user cisco]: New Sensor
Anomaly Detection Configuration
  [1] ad0
  [2] Create a new anomaly detection configuration
Option[2]:
```

**Step 16** Enter **1** to use the existing anomaly-detection configuration, ad0.

```
Signature Definition Configuration
  [1] sig0
  [2] Create a new signature definition configuration
Option[2]:
```

**Step 17** Enter **2** to create a signature-definition configuration file.

**Step 18** Enter the signature-definition configuration name, **newSig**.

```
Event Action Rules Configuration
  [1] rules0
  [2] Create a new event action rules configuration
Option[2]:
```

**Step 19** Enter **1** to use the existing event-action-rules configuration, rules0.

**Note** If PortChannel 0/0 has not been assigned to vs0, you are prompted to assign it to the new virtual sensor.

```
Virtual Sensor: newVs
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: newSig
  Monitored:
   PortChannel0/0

  [1] Remove virtual sensor.
  [2] Modify "newVs" virtual sensor configuration.
  [3] Modify "vs0" virtual sensor configuration.
  [4] Create new virtual sensor.
Option:
```

**Step 20** Press **Enter** to exit the interface and virtual sensor configuration menu.

```
Modify default threat prevention settings?[no]:
```

**Step 21** Enter **yes** if you want to modify the default threat prevention settings.

**Note** The sensor comes with a built-in override to add the deny packet event action to high risk rating alerts. If you do not want this protection, disable automatic threat prevention.

```
Virtual sensor newVs is configured to prevent high risk threats in inline mode. (Risk
Rating 90-100)
Virtual sensor vs0 is configured to prevent high risk threats in inline mode.(Risk Rating
90-100)
Do you want to disable automatic threat prevention on all virtual sensors?[no]:
```

**Step 22** Enter **yes** to disable automatic threat prevention on all virtual sensors.

```
The following configuration was entered.

service host
network-settings
host-ip 192.168.1.2/24,192.168.1.1
host-name asa-ips
telnet-option disabled
sshv1-fallback enabled
access-list 10.0.0.0/8
access-list 64.0.0.0/8
```

```
ftp-timeout 300
no login-banner-text
exit
time-zone-settings
offset 0
standard-time-zone-name UTC
exit
summertime-option disabled
ntp-option disabled
exit
service web-server
port 342
exit
service analysis-engine
virtual-sensor newVs
description New Sensor
signature-definition newSig
event-action-rules rules0
anomaly-detection
anomaly-detection-name ad0
exit
physical-interfaces PortChannel0/0
exit
exit
service event-action-rules rules0
overrides deny-packet-inline
override-item-status Disabled
risk-rating-range 90-100
exit
exit

[0] Go to the command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration and exit setup.
```

**Step 23** Enter **2** to save the configuration.

```
Enter your selection[2]: 2
Configuration Saved.
```

**Step 24** Reboot the ASA 5500-X IPS SSP.

```
asa-ips# reset
Warning: Executing this command will stop all applications and reboot the node.
Continue with reset? []:
```

**Step 25** Enter **yes** to continue the reboot.

**Step 26** After reboot, log in to the sensor, and display the self-signed X.509 certificate (needed by TLS).

```
asa-ips# show tls fingerprint
MD5: C4:BC:F2:92:C2:E2:4D:EB:92:0F:E4:86:53:6A:C6:01
SHA1: 64:9B:AC:DE:21:62:0C:D3:57:2E:9B:E5:3D:04:8F:A7:FD:CD:6F:27
```

**Step 27** Write down the certificate fingerprints. You need the fingerprints to check the authenticity of the certificate when using HTTPS to connect to this ASA 5500-X IPS SSP with a web browser.

**Step 28** Apply the most recent service pack and signature update. You are now ready to configure the ASA 5500-X IPS SSP for intrusion prevention.

### For More Information

- For the procedure for obtaining the most recent IPS software, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.
- For the procedures for configuring intrusion prevention on your sensor, refer to the following guides:
  - *Cisco Intrusion Prevention System Device Manager Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Manager Express Configuration Guide for IPS 7.1*
  - *Cisco Intrusion Prevention System Sensor CLI Configuration Guide for IPS 7.1*

# Advanced Setup for the ASA 5585-X IPS SSP

To continue with advanced setup for the ASA 5585-X IPS SSP, follow these steps:

**Step 1** Session in to the ASA 5585-X IPS SSP using an account with administrator privileges.

```
asa# session 1
```

**Step 2** Enter the **setup** command. The System Configuration Dialog is displayed. Press **Enter** or the spacebar to skip to the menu to access advanced setup.

**Step 3** Enter **3** to access advanced setup.

**Step 4** Specify the Telnet server status. You can disable or enable Telnet services. The default is disabled.

**Step 5** Specify the SSHv1 fallback setting. The default is enabled.

**Step 6** Specify the web server port. The web server port is the TCP port used by the web server (1 to 65535). The default is 443.

**Note** The web server is configured to use TLS/SSL encryption by default. Setting the port to 80 does not disable the encryption.

**Step 7** Enter **yes** to modify the interface and virtual sensor configuration.

```
Current interface configuration
 Command control: Management0/0
 Unassigned:
  Monitored:
   PortChannel0/0

 Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 8** Enter **1** to edit the interface configuration.

**Note** You do not need to configure interfaces on the ASA 5585-X IPS SSP. You should ignore the modify interface default VLAN setting. The separation of traffic across virtual sensors is configured differently for the ASA 5585-X IPS SSP than for other sensors.

```
  [1] Modify interface default-vlan.
Option:
```

**Step 9** Press **Enter** to return to the top-level interface and virtual sensor configuration menu.

```
  [1] Edit Interface Configuration
  [2] Edit Virtual Sensor Configuration
  [3] Display configuration
Option:
```

**Step 10** Enter **2** to edit the virtual sensor configuration.

```
  [1] Remove virtual sensor.
  [2] Modify "vs0" virtual sensor configuration.
  [3] Create new virtual sensor.
Option:
```

**Step 11** Enter **2** to modify the virtual sensor vs0 configuration.

```
Virtual Sensor: vs0
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: sig0

No Interfaces to remove.

 Unassigned:
  Monitored:
   [1] PortChannel0/0
Add Interface:
```

**Step 12** Enter **1** to add PortChannel 0/0 to virtual sensor vs0.

**Note** Multiple virtual sensors are supported. The adaptive security appliance can direct packets to specific virtual sensors or can send packets to be monitored by a default virtual sensor. The default virtual sensor is the virtual sensor to which you assign PortChannel 0/0. We recommend that you assign PortChannel 0/0 to vs0, but you can assign it to another virtual sensor if you want to.

**Step 13** Press **Enter** to return to the main virtual sensor menu.

**Step 14** Enter **3** to create a virtual sensor.

```
Name[]:
```

**Step 15** Enter a name and description for your virtual sensor.

```
Name[]: newVs
Description[Created via setup by user cisco]: New Sensor
Anomaly Detection Configuration
  [1] ad0
  [2] Create a new anomaly detection configuration
Option[2]:
```

**Step 16** Enter **1** to use the existing anomaly-detection configuration, ad0.

```
Signature Definition Configuration
  [1] sig0
  [2] Create a new signature definition configuration
Option[2]:
```

**Step 17** Enter **2** to create a signature-definition configuration file.

**Step 18** Enter the signature-definition configuration name, **newSig**.

```
Event Action Rules Configuration
  [1] rules0
  [2] Create a new event action rules configuration
Option[2]:
```

**Step 19** Enter **1** to use the existing event action rules configuration, rules0.

**Note** If PortChannel 0/0 has not been assigned to vs0, you are prompted to assign it to the new virtual sensor.

```
Virtual Sensor: newVs
  Anomaly Detection: ad0
  Event Action Rules: rules0
  Signature Definitions: newSig
  Monitored:
   PortChannel0/0

  [1] Remove virtual sensor.
  [2] Modify "newVs" virtual sensor configuration.
  [3] Modify "vs0" virtual sensor configuration.
  [4] Create new virtual sensor.
Option:
```

**Step 20** Press **Enter** to exit the interface and virtual sensor configuration menu.

```
Modify default threat prevention settings?[no]:
```

**Step 21** Enter **yes** if you want to modify the default threat prevention settings.

**Note** The sensor comes with a built-in override to add the deny packet event action to high risk rating alerts. If you do not want this protection, disable automatic threat prevention.

```
Virtual sensor newVs is configured to prevent high risk threats in inline mode. (Risk
Rating 90-100)
Virtual sensor vs0 is configured to prevent high risk threats in inline mode.(Risk Rating
90-100)
Do you want to disable automatic threat prevention on all virtual sensors?[no]:
```

**Step 22** Enter **yes** to disable automatic threat prevention on all virtual sensors.

```
The following configuration was entered.

service host
network-settings
host-ip 10.1.9.201/24,10.1.9.1
host-name ips-ssm
telnet-option disabled
sshv1-fallback enabled
access-list 10.0.0.0/8
access-list 64.0.0.0/8
```

```
ftp-timeout 300
no login-banner-text
exit
time-zone-settings
offset 0
standard-time-zone-name UTC
exit
summertime-option disabled
ntp-option disabled
exit
service web-server
port 342
exit
service analysis-engine
virtual-sensor newVs
description New Sensor
signature-definition newSig
event-action-rules rules0
anomaly-detection
anomaly-detection-name ad0
exit
physical-interfaces PortChannel0/0
exit
exit
service event-action-rules rules0
overrides deny-packet-inline
override-item-status Disabled
risk-rating-range 90-100
exit
exit

[0] Go to the command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration and exit setup.
```

**Step 23** Enter **2** to save the configuration.

```
Enter your selection[2]: 2
Configuration Saved.
```

**Step 24** Reboot the ASA 5585-X IPS SSP.

```
ips-ssp# reset
Warning: Executing this command will stop all applications and reboot the node.
Continue with reset? []:
```

**Step 25** Enter **yes** to continue the reboot.

**Step 26** After reboot, log in to the sensor, and display the self-signed X.509 certificate (needed by TLS).

```
ips-ssp# show tls fingerprint
MD5: C4:BC:F2:92:C2:E2:4D:EB:92:0F:E4:86:53:6A:C6:01
SHA1: 64:9B:AC:DE:21:62:0C:D3:57:2E:9B:E5:3D:04:8F:A7:FD:CD:6F:27
```

**Step 27** Write down the certificate fingerprints. You need the fingerprints to check the authenticity of the certificate when using HTTPS to connect to this ASA 5585-X IPS SSP with a web browser.

**Step 28** Apply the most recent service pack and signature update. You are now ready to configure your ASA 5585-X IPS SSP for intrusion prevention.

---

### For More Information

For the procedure for using HTTPS to log in to the IDM, refer to Logging In to the IDM.

# Verifying Initialization

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

To verify that you initialized your sensor, follow these steps:

**Step 1** Log in to the sensor.

**Step 2** View your configuration.

```
sensor# show configuration
! ------------------------------
! Current configuration last modified Tue Nov 01 10:40:39 2011
! ------------------------------
! Version 7.1(3)
! Host:
!     Realm Keys          key1.0
! Signature Definition:
!     Signature Update    S581.0   2011-07-11
! ------------------------------
service interface
exit
! ------------------------------
service authentication
permit-packet-logging true
exit
! ------------------------------
service event-action-rules rules0
exit
! ------------------------------
service host
network-settings
host-ip 192.168.1.2/24,192.168.1.1
host-name sensor
telnet-option enabled
access-list 0.0.0.0/0
dns-primary-server disabled
dns-secondary-server disabled
dns-tertiary-server disabled
exit
time-zone-settings
offset -360
standard-time-zone-name GMT-06:00
exit
exit
! ------------------------------
service logger
exit
! ------------------------------
service network-access
exit
! ------------------------------
service notification
exit
! ------------------------------
service signature-definition sig0
signatures 2000 0
alert-frequency
summary-mode fire-all
```

```
exit
exit
status
enabled true
exit
exit
signatures 2004 0
alert-frequency
summary-mode fire-all
exit
exit
status
enabled true
exit
exit
exit
! ------------------------------
service ssh-known-hosts
rsa1-keys 10.89.146.1
length 1024
exponent 35
modulus 12783094292288326767015615132168773328115097561020607196221632570955980 2
699981494787484312020602185392505699544878203683727423329634864651226752781034 55
023820741470819765804773674487613727040180067491475301153544560864727358878607 80
209232035656491654023918931928054450310003049389864127423289403797118690154 27
exit
exit
! ------------------------------
service trusted-certificates
exit
! ------------------------------
service web-server
exit
! ------------------------------
service anomaly-detection ad0
exit
! ------------------------------
service external-product-interface
exit
! ------------------------------
service health-monitor
exit
! ------------------------------
service global-correlation
exit
! ------------------------------
service aaa
exit
! ------------------------------
service analysis-engine
exit
sensor#
```

**Note** You can also use the **more current-config** command to view your configuration.

**Step 3** Display the self-signed X.509 certificate (needed by TLS).

```
sensor# show tls fingerprint
MD5: C4:BC:F2:92:C2:E2:4D:EB:92:0F:E4:86:53:6A:C6:01
SHA1: 64:9B:AC:DE:21:62:0C:D3:57:2E:9B:E5:3D:04:8F:A7:FD:CD:6F:27
```

**Step 4** Write down the certificate fingerprints. You need the fingerprints to check the authenticity of the certificate when connecting to this sensor with a web browser.

# Obtaining Software

## Contents

This chapter provides information on obtaining Cisco IPS software for the sensor. It contains the following sections:


- Obtaining Cisco IPS Software, page C-1
- IPS 7.1 Files, page C-2
- IPS Software Versioning, page C-3
- IPS Software Release Examples, page C-5
- Accessing IPS Documentation, page C-7
- Cisco Security Intelligence Operations, page C-7
- Obtaining a License Key From Cisco.com, page C-8


## Obtaining Cisco IPS Software

You can find major and minor updates, service packs, signature and signature engine updates, system and recovery files, firmware upgrades, and Readmes on the Download Software site on Cisco.com. Signature updates are posted to Cisco.com approximately every week, more often if needed. Service packs are posted to Cisco.com in a release train format, a new release every three months. Major and minor updates are also posted periodically. Check Cisco.com regularly for the latest IPS software.

You must have an account with cryptographic access before you can download software. You set this account up the first time you download IPS software from the Download Software site.

**Note** You must be logged in to Cisco.com to download software. You must have an active IPS maintenance contract and a Cisco.com password to download software. You must have a sensor license to apply signature updates.

### Downloading Cisco IPS Software

To download software on Cisco.com, follow these steps:

**Step 1** Log in to Cisco.com.

**Step 2** From the Support drop-down menu, choose **Download Software**.

**Step 3** Under Select a Software Product Category, choose **Security Software**.

**Step 4** Choose **Intrusion Prevention System (IPS)**.

**Step 5** Enter your username and password.

**Step 6** In the Download Software window, choose **IPS Appliances > Cisco Intrusion Prevention System** and then click the version you want to download.

**Note** You must have an IPS subscription service license to download software.

**Step 7** Click the type of software file you need. The available files appear in a list in the right side of the window. You can sort by file name, file size, memory, and release date. And you can access the Release Notes and other product documentation.

**Step 8** Click the file you want to download. The file details appear.

**Step 9** Verify that it is the correct file, and click **Download**.

**Step 10** Click **Agree** to accept the software download rules. The File Download dialog box appears. The first time you download a file from Cisco.com, you must fill in the Encryption Software Export Distribution Authorization form before you can download the software.

a. Fill out the form and click **Submit**. The Cisco Systems Inc. Encryption Software Usage Handling and Distribution Policy appears.

b. Read the policy and click **I Accept**. The Encryption Software Export/Distribution Form appears.

If you previously filled out the Encryption Software Export Distribution Authorization form, and read and accepted the Cisco Systems Inc. Encryption Software Usage Handling and Distribution Policy, these forms are not displayed again.

**Step 11** Open the file or save it to your computer.

**Step 12** Follow the instructions in the Readme or the Release Notes to install the update.

### For More Information

- For the procedure for obtaining and installing the license key, see Obtaining a License Key From Cisco.com, page C-8.
- For an explanation of the IPS file versioning scheme, see IPS Software Versioning, page C-3.

# IPS 7.1 Files

The currently supported IPS 7.1(*x*) versions are 7.1(1)E4, 7.1(2)E4, 7.1(3)E4, 7.1(4)E4, 7.1(5)E4, 7.1(6)E4, 7.1(7)E4, 7.1(8)E4, and 7.1(9)E4. All IPS sensors are not supported in each 7.1(*x*) version. For a list of the specific IPS filenames and the IPS versions that each sensor supports, refer to the Release Notes for your IPS version found at this URL:

http://www.cisco.com/en/US/products/hw/vpndevc/ps4077/prod_release_notes_list.html

# IPS Software Versioning

When you download IPS software images from Cisco.com, you should understand the versioning scheme so that you know which files are base files, which are cumulative, and which are incremental. This section describes the various IPS software files.

### Major Update

A major update contains new functionality or an architectural change in the product. For example, the Cisco IPS 7.1 base version includes everything (except deprecated features) since the previous major release (the minor update features, service pack fixes, and signature updates) plus any new changes. Major update 7.1(1) requires 5.1(6) and later. With each major update there are corresponding system and recovery packages.

**Note** The 7.1(1) major update is used to upgrade 5.1(6) and later sensors to 7.1(1) If you are reinstalling 7.1(1) on a sensor that already has 7.1(1) installed, use the system image or recovery procedures rather than the major update.

### Minor Update

A minor update is incremental to the major version. Minor updates are also base versions for service packs. The first minor update for 7.1 is 7.2. Minor updates are released for minor enhancements to the product. Minor updates contain all previous minor features (except deprecated features), service pack fixes, signature updates since the last major version, and the new minor features being released. You can install the minor updates on the previous major or minor version (and often even on earlier versions). The minimum supported version needed to upgrade to the newest minor version is listed in the Readme that accompanies the minor update. With each minor update there are corresponding system and recovery packages.

### Service Pack

A service packs is cumulative following a base version release (minor or major). Service packs are released in a train release format with several new features per train. Service packs contain all service pack fixes since the last base version (minor or major) and the new features and defect fixes being released. Service packs require the minor version. The minimum supported version needed to upgrade to the newest service pack is listed in the Readme that accompanies the service pack. Service packs also include the latest engine update. For example, if service pack 7.1(3) is released, and E4 is the latest engine level, the service pack is released as 7.1(3)E4.

### Patch Release

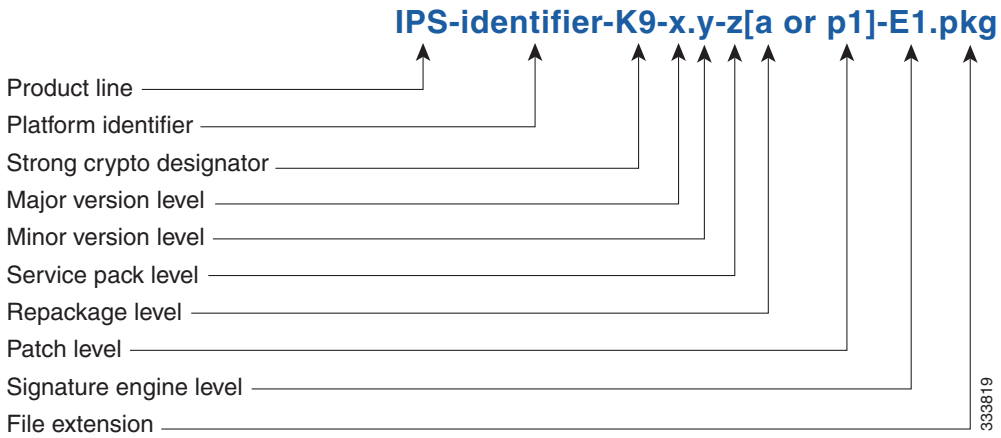
A patch release is used to address defects that are identified in the upgrade binaries after a software release. Rather than waiting until the next major or minor update, or service pack to address these defects, a patch can be posted. Patches include all prior patch releases within the associated service pack level. The patches roll into the next official major or minor update, or service pack.

Before you can install a patch release, the most recent major or minor update, or service pack must be installed. For example, patch release 7.1(1p1) requires 7.1(1).

**Note** Upgrading to a newer patch does not require you to uninstall the old patch. For example, you can upgrade from patch 7.1(1p1) to 7.1(1p2) without first uninstalling 7.1(1p1).

Figure C-1 illustrates what each part of the IPS software file represents for major and minor updates, service packs, and patch releases.

*Figure C-1 IPS Software File Name for Major and Minor Updates, Service Packs, and Patch Releases*



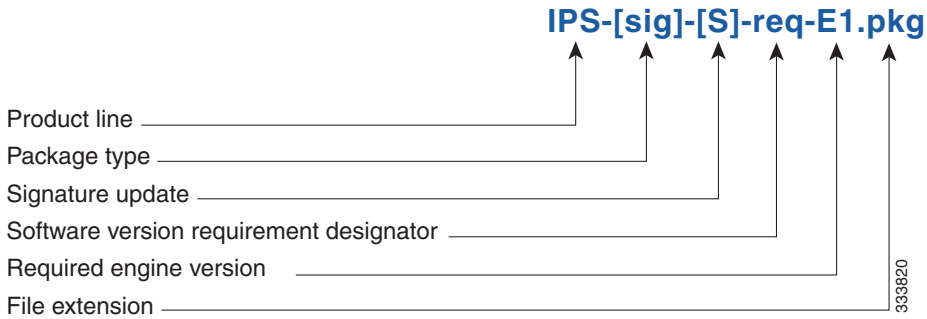

### Signature Update and Signature Engine Update

A signature update is a package file containing a set of rules designed to recognize malicious network activities. Signature updates are released independently from other software updates. Each time a major or minor update is released, you can install signature updates on the new version and the next oldest version for a period of at least six months. Signature updates are dependent on a required signature engine version. Because of this, a *req* designator lists the signature engine required to support a particular signature update.

The signature engine update is included in the signature update.

Figure C-2 illustrates what each part of the IPS software file represents for signature updates and signature engine updates.

*Figure C-2 IPS Software File Name for Signature Updates and Signature Engine Updates*



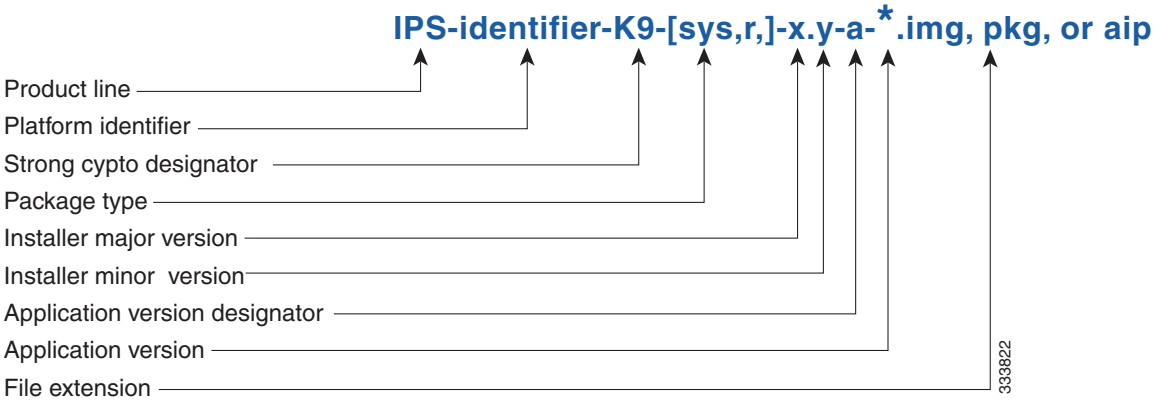
### Recovery and System Image Files

Recovery and system image files contain separate versions for the installer and the underlying application. The installer version contains a major and minor version field. The major version is incremented by one of any major changes to the image installer, for example, switching from .tar to rpm or changing kernels. The minor version can be incremented by any one of the following:

- Minor change to the installer, for example, a user prompt added.
- Repackages require the installer minor version to be incremented by one if the image file must be repackaged to address a defect or problem with the installer.

Figure C-3 illustrates what each part of the IPS software file represents for recovery and system image filenames.

*Figure C-3 IPS Software File Name for Recovery and System Image Files*




# IPS Software Release Examples

Table C-1 lists the Cisco IPS software release examples.

*Table C-1 Release Examples*

| Release | Target Frequency | Identifier | Example Version | Example Filename |
|---|---|---|---|---|
| Signature update and signature engine update[1] | Weekly for signature updates, as needed for signature engine updates | sig | S552<br>E4 | IPS-*identifier*-sig-S552-req-E4.pkg |
| Service packs[2] | Every three months | — | 7.1(2) | IPS-*identifier*-K9-7.1-2-E4.pkg |
| Minor version update[3] | Annually | — | 7.1(1) | IPS-*identifier*-K9-7.1-2-E4.pkg |
| Major version update[4] | Annually | — | 8.0(1) | IPS-*identifier*-K9-8.0-1-E4.pkg |
| Patch release[5] | As needed | patch | 7.2(1p1) | IPS-*identifier*-K9-patch-7.2-1pl-E4.pkg |

| Release | Target Frequency | Identifier | Example Version | Example Filename |
|---|---|---|---|---|
| Recovery package[6] | Annually or as needed | r | 1.1-7.2(1) | IPS-*identifier*-K9-r-1.1-a-7.2-1-E4.pkg |
| System image[7] | Annually | sys | Separate file per sensor platform | IPS-SSP_60-K9-sys-1.1-a-7.1-2-E4.img<br>IPS-4345-K9-sys-1.1-a-7.1-2-E4.img<br>IPS-SSP_5545-K9-sys-1.1-a-7.1-2-E4.aip<br>IPS-4510-K9-sys-1.1-a-7.1-4-E4.img |

1. Signature updates include the latest cumulative IPS signatures. Signature engine updates add new engines or engine parameters that are used by new signatures in later signature updates.
2. Service packs include new features and defect fixes.
3. Minor versions include new minor version features and/or minor version functionality.
4. Major versions include new major version functionality or new architecture.
5. Patch releases are for interim fixes.
6. The r 1.1 can be revised to r 1.2 if it is necessary to release a new recovery package that contains the same underlying application image. If there are defect fixes for the installer, for example, the underlying application version may still be 7.1(3), but the recovery partition image will be r 1.2.
7. The system image includes the combined recovery and application image used to reimage an entire sensor.

Table C-2 describes the platform identifiers used in platform-specific names.

***Table C-2 Platform Identifiers***

| Sensor Family | Identifier |
|---|---|
| ASA 5500 series | SSM_10<br>SSM_20<br>SSM_40 |
| ASA 5500-X series | SSP_5512<br>SSP_5515<br>SSP_5525<br>SSP_5545<br>SSP_5555 |
| ASA 5585-X series | SSP_10<br>SSP_20<br>SSP_40<br>SSP_60 |
| IPS 4240 series | 4240 |
| IPS 4255 series | 4255 |
| IPS 4260 series | 4260 |
| IPS 4270-20 series | 4270_20 |
| IPS 4345 series | 4345 |
| IPS 4360 series | 4360 |
| IPS 4510 series | 4510 |
| IPS 4520 series | 4520 |

### For More Information

For instructions on how to access these files on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Accessing IPS Documentation

You can find IPS documentation at this URL:

http://www.cisco.com/en/US/products/hw/vpndevc/ps4077/tsd_products_support_series_home.html

Or to access IPS documentation from Cisco.com, follow these steps:

**Step 1** Log in to Cisco.com.

**Step 2** Click **Support**.

**Step 3** Under Support at the bottom of the page, click **Documentation**.

**Step 4** Choose **Products > Security > Intrusion Prevention System (IPS) > IPS Appliances > Cisco IPS 4200 Series Sensors**. The Cisco IPS 4200 Series Sensors page appears. All of the most up-to-date IPS documentation is on this page.

**Note** Although you will see references to other IPS documentation sites on Cisco.com, this is the site with the most complete and up-to-date IPS documentation.

**Step 5** Click one of the following categories to access Cisco IPS documentation:

- **Download Software**—Takes you to the Download Software site.

  **Note** You must be logged into Cisco.com to access the software download site.

- **Release and General Information**—Contains documentation roadmaps and release notes.
- **Reference Guides**—Contains command references and technical references.
- **Design**—Contains design guide and design tech notes.
- **Install and Upgrade**—Contains hardware installation and regulatory guides.
- **Configure**—Contains configuration guides for IPS CLI, IDM, and IME.
- **Troubleshoot and Alerts**—Contains TAC tech notes and field notices.

# Cisco Security Intelligence Operations

The Cisco Security Intelligence Operations site on Cisco.com provides intelligence reports about current vulnerabilities and security threats. It also has reports on other security topics that help you protect your network and deploy your security systems to reduce organizational risk.

You should be aware of the most recent security threats so that you can most effectively secure and manage your network. Cisco Security Intelligence Operations contains the top ten intelligence reports listed by date, severity, urgency, and whether there is a new signature available to deal with the threat.

Cisco Security Intelligence Operations contains a Security News section that lists security articles of interest. There are related security tools and links.

You can access Cisco Security Intelligence Operations at this URL:

http://tools.cisco.com/security/center/home.x

Cisco Security Intelligence Operations is also a repository of information for individual signatures, including signature ID, type, structure, and description.

You can search for security alerts and signatures at this URL:

http://tools.cisco.com/security/center/search.x

# Obtaining a License Key From Cisco.com

This section describes how to obtain a license key from Cisco.com and how to install it using the CLI, the IDM, or the IME. It contains the following topics:


- Understanding Licensing, page C-8
- Service Programs for IPS Products, page C-9
- Obtaining and Installing the License Key Using the IDM or the IME, page C-10
- Obtaining a License for the IPS 4270-20, page C-13
- Licensing the ASA 5500-X IPS SSP, page C-14
- Uninstalling the License Key, page C-14


## Understanding Licensing

Although the sensor functions without the license key, you must have a license key to obtain signature updates and use the global correlation features. To obtain a license key, you must have the following:

- Cisco Service for IPS service contract—Contact your reseller, Cisco service or product sales to purchase a contract.
- Your IPS device serial number—To find the IPS device serial number in the IDM or the IME, for the IDM choose **Configuration > Sensor Management > Licensing**, and for the IME choose **Configuration > *sensor_name* > Sensor Management > Licensing**, or in the CLI use the **show version** command.
- Valid Cisco.com username and password.

Trial license keys are also available. If you cannot get your sensor licensed because of problems with your contract, you can obtain a 60-day trial license that supports signature updates that require licensing.

You can obtain a license key from the Cisco.com licensing server, which is then delivered to the sensor. Or, you can update the license key from a license key provided in a local file. Go to http://www.cisco.com/go/license and click **IPS Signature Subscription Service** to apply for a license key.

You can view the status of the license key in these places:

- The IDM Home window Licensing section on the Health tab
- The IDM Licensing pane (**Configuration > Licensing**)
- The IME Home page in the Device Details section on the Licensing tab
- License Notice at CLI login

Whenever you start the IDM, the IME, or the CLI, you are informed of your license status—whether you have a trial, invalid, or expired license key. With no license key, an invalid license key, or an expired license key, you can continue to use the IDM, the IME, and the CLI, but you cannot download signature updates.

If you already have a valid license on the sensor, you can click **Download** on the License pane to download a copy of your license key to the computer that the IDM or IME is running on and save it to a local file. You can then replace a lost or corrupted license, or reinstall your license after you have reimaged the sensor.

# Service Programs for IPS Products

You must have a Cisco Services for IPS service contract for any IPS product so that you can download a license key and obtain the latest IPS signature updates. If you have a direct relationship with Cisco Systems, contact your account manager or service account manager to purchase the Cisco Services for IPS service contract. If you do not have a direct relationship with Cisco Systems, you can purchase the service account from a one-tier or two-tier partner.

When you purchase the following IPS products you must also purchase a Cisco Services for IPS service contract:

- IPS 4240
- IPS 4255
- IPS 4260
- IPS 4270-20
- IPS 4345
- IPS 4360
- IPS 4510
- IPS 4520

When you purchase an ASA 5500 series adaptive security appliance product that does not contain IPS, you must purchase a SMARTnet contract.

**Note** SMARTnet provides operating system updates, access to Cisco.com, access to TAC, and hardware replacement NBD on site.

When you purchase an ASA 5500 series adaptive security appliance product that ships with an IPS module installed, or if you purchase one to add to your ASA 5500 series adaptive security appliance product, you must purchase the Cisco Services for IPS service contract.

**Note** Cisco Services for IPS provides IPS signature updates, operating system updates, access to Cisco.com, access to TAC, and hardware replacement NBD on site.

For example, if you purchase an ASA 5585-X and then later want to add IPS and purchase an ASA-IPS10-K9, you must now purchase the Cisco Services for IPS service contract. After you have the Cisco Services for IPS service contract, you must also have your product serial number to apply for the license key.

**Caution** If you ever send your product for RMA, the serial number changes. You must then get a new license key for the new serial number.

# Obtaining and Installing the License Key Using the IDM or the IME

**Note** In addition to a valid Cisco.com username and password, you must also have a Cisco Services for IPS service contract before you can apply for a license key.

To obtain and install the license key, follow these steps:

**Step 1** Log in to the IDM or the IME using an account with administrator privileges.

**Step 2** For the IDM choose **Configuration > Sensor Management > Licensing**. For the IME choose **Configuration > *sensor_name* > Sensor Management > Licensing**.

**Step 3** The Licensing pane displays the status of the current license. If you have already installed your license, you can click **Download** to save it if needed.

**Step 4** Obtain a license key by doing one of the following:

- Click the **Cisco.com** radio button to obtain the license from Cisco.com. The IDM or the IME contacts the license server on Cisco.com and sends the server the serial number to obtain the license key. This is the default method. Go to Step 5.
- Click the **License File** radio button to use a license file. To use this option, you must apply for a license key at this URL: www.cisco.com/go/license. The license key is sent to you in e-mail and you save it to a drive that the IDM or the IME can access. This option is useful if your computer cannot access Cisco.com. Go to Step 7.

**Step 5** Click **Update License**, and in the Licensing dialog box, click **Yes** to continue. The Status dialog box informs you that the sensor is trying to connect to Cisco.com. An Information dialog box confirms that the license key has been updated.

**Step 6** Click **OK**.

**Step 7** Log in to Cisco.com.

**Step 8** Go to www.cisco.com/go/license.

**Step 9** Fill in the required fields. Your license key will be sent to the e-mail address you specified.

**Caution** You must have the correct IPS device serial number and product identifier (PID) because the license key only functions on the device with that number.

**Step 10** Save the license key to a hard-disk drive or a network drive that the client running the IDM or the IME can access.

**Step 11** Log in to the IDM or the IME.

**Step 12** For the IDM choose **Configuration > Sensor Management > Licensing**. For the IME choose **Configuration > *sensor_name* > Sensor Management > Licensing**.

**Step 13** Under Update License, click the **License File** radio button.

**Step 14** In the Local File Path field, specify the path to the license file or click **Browse Local** to browse to the file.

**Step 15** Browse to the license file and click **Open**.

**Step 16** Click **Update License**.

### For More Information

For more information about obtaining a Cisco Services for IPS service contract, see Service Programs for IPS Products, page C-9.

# Obtaining and Installing the License Key Using the CLI

**Note** You cannot install an older license key over a newer license key.

Use the **copy** *source-url license_file_name* **license-key** command to copy the license key to your sensor. The following options apply:

- *source-url*—The location of the source file to be copied. It can be a URL or keyword.
- *destination-url*—The location of the destination file to be copied. It can be a URL or a keyword.
- **license-key**—The subscription license file.
- *license_file_name*—The name of the license file you receive.

The exact format of the source and destination URLs varies according to the file. Here are the valid types:

- ftp:—Source URL for an FTP network server. The syntax for this prefix is:

  ftp://[[username@]location][/relativeDirectory]/filename

  ftp://[[username@]location][//absoluteDirectory]/filename

  **Note** You are prompted for a password.

- scp:—Source URL for the SCP network server. The syntax for this prefix is:

  scp://[[username@]location][/relativeDirectory]/filename

  scp://[[username@]location][//absoluteDirectory]/filename

  **Note** You are prompted for a password. You must add the remote host to the SSH known hosts list.

- http:—Source URL for the web server. The syntax for this prefix is:

  http://[[username@]location][/directory]/filename

  **Note** The directory specification should be an absolute path to the desired file.

- https:—Source URL for the web server. The syntax for this prefix is:

  https://[[username@]location][/directory]/filename

The directory specification should be an absolute path to the desired file. The remote host must be a TLS trusted host.**Installing the License Key**

To install the license key, follow these steps:

**Step 1** Log in to Cisco.com.

**Step 2** Apply for the license key at this URL: www.cisco.com/go/license.

**Note** In addition to a valid Cisco.com username and password, you must also have a Cisco Services for IPS service contract before you can apply for a license key.

**Step 3** Fill in the required fields. Your Cisco IPS Signature Subscription Service license key will be sent by email to the e-mail address you specified.

**Note** You must have the correct IPS device serial number and product identifier (PID) because the license key only functions on the device with that number.

**Step 4** Save the license key to a system that has a Web server, FTP server, or SCP server.

**Step 5** Log in to the CLI using an account with administrator privileges.

**Step 6** Copy the license key to the sensor.

```
sensor# copy scp://user@192.168.1.2/24://tftpboot/dev.lic license-key
Password: *******
```

**Step 7** Verify the sensor is licensed.

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
Serial Number:          123456789AB
No license present
Sensor up-time is 12 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.6M out of 171.6M bytes of available disk space (43% usage)
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96% usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600    Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600    Running
```

```
CollaborationApp    S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600    Running
CLI                 S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600

Upgrade History:

  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4

Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013
sensor#
```

### For More Information

- For the procedure for adding a remote host to the SSH known hosts list, for the IDM refer to Defining Known Hosts Keys, for the IME refer to Defining Known Host Keys, and for the CLI, refer to Adding Hosts to the SSH Known Hosts List.
- For the procedure for adding a remote host to the trusted hosts list, for the IDM refer to Adding Trusted Hosts, for the IME refer to Adding Trusted Hosts, and for the CLI, refer to Adding TLS Trusted Hosts.
- For more information about obtaining a Cisco Services for IPS service contract, see Service Programs for IPS Products, page C-9.

# Obtaining a License for the IPS 4270-20

If your IPS 4270-20 has a license that was generated for IPS 6.0.*x* versions or earlier, you need to get a new license.

To obtain a new license for your IPS 4270-20, follow these steps:

**Step 1** Log in to Cisco.com.

**Step 2** Go to www.cisco.com/go/license.

**Step 3** Under Licenses Not Requiring a PAK, click **Demo and Evaluation licenses**.

**Step 4** Under Security Products/Cisco Services for IPS service license (Version 6.1 and later), click **All IPS Hardware Platforms**.

**Step 5** Fill in the required fields. Your license key will be sent to the email address you specified.

**Caution** You must have the correct IPS device serial number and product identifier (PID) because the license key only functions on the device with that number.

**Step 6** Save the license key to a hard-disk drive or a network drive that the client running the IDM or the IME can access.

**Step 7** Log in to the IDM or the IME.

**Step 8** For the IDM choose **Configuration > Sensor Management > Licensing**. For the IME choose **Configuration > *sensor_name* > Sensor Management > Licensing**.

**Step 9** Under Update License, click the **License File** radio button.

**Step 10** In the Local File Path field, specify the path to the license file or click **Browse Local** to browse to the file.

**Step 11** Browse to the license file and click **Open**.

**Step 12** Click **Update License**.

# Licensing the ASA 5500-X IPS SSP

For the ASA 5500-X series adaptive security appliances with the IPS SSP, the ASA requires the IPS Module license. To view your current ASA licenses, in ASDM choose **Home > Device Dashboard > Device Information > Device License**. For more information about ASA licenses, refer to the licensing chapter in the configuration guide. After you obtain the ASA IPS Module license, you can obtain and install the IPS license key.

### For More Information

- For more information about getting started using the ASA 5500-X IPS SSP, refer to the *Cisco IPS Module on the ASA Quick Start Guide*.
- For the procedures for obtaining and installing the IPS License key, see Obtaining a License Key From Cisco.com, page C-8.

# Uninstalling the License Key

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

Use the **erase license-key** command to uninstall the license key on your sensor. This allows you to delete an installed license key from a sensor without restarting the sensor or logging into the sensor using the service account. Uninstalling the license key is supported in IPS 7.1(3)E4 and later.

To uninstall the license key, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Uninstall the license key on the sensor.

```
sensor# erase license-key
Warning: Executing this command will remove the license key installed on the sensor.

You must have a valid license key installed on the sensor to apply the Signature Updates
and use the Global Correlation features.

Continue? []: yes
sensor#
```

**Step 3** Verify the sensor key has been uninstalled.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(4)E4

Host:
```

```
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S615.0                  2012-01-03
OS Version:             2.6.29.1
Platform:               IPS-4345-K9
Serial Number:          FCH1445V00N
No license present
Sensor up-time is 5 days.
Using 5318M out of 7864M bytes of available memory (67% usage)
system is using 33.6M out of 160.0M bytes of available disk space (21% usage)
application-data is using 70.5M out of 169.4M bytes of available disk space (44% usage)
boot is using 62.5M out of 70.1M bytes of available disk space (94% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96% usage)


MainApp            S-2012_APR_26_07_45_7_1_4_68   (Release)   2012-04-26T07:48:4
3-0500   Running
AnalysisEngine     S-2012_APR_26_07_45_7_1_4_68   (Release)   2012-04-26T07:48:4
3-0500   Running
CollaborationApp   S-2012_APR_26_07_45_7_1_4_68   (Release)   2012-04-26T07:48:4
3-0500   Running
CLI                S-2012_APR_26_07_45_7_1_4_68   (Release)   2012-04-26T07:48:4
3-0500

Upgrade History:

  IPS-K9-7.1-4-E4   08:05:07 UTC Thu Apr 26 2012

Recovery Partition Version 1.1 - 7.1(4)E4

Host Certificate Valid from: 25-Apr-2012 to 26-Apr-2014
```

# Upgrading, Downgrading, and Installing System Images

## Contents

This chapter describes how to upgrade, downgrade, and install system images. It contains the following sections:


- System Image Notes and Caveats, page D-1
- Upgrades, Downgrades, and System Images, page D-2
- Supported FTP and HTTP/HTTPS Servers, page D-3
- Upgrading the Sensor, page D-3
- Configuring Automatic Upgrades, page D-7
- Downgrading the Sensor, page D-11
- Recovering the Application Partition, page D-12
- Installing System Images, page D-13


## System Image Notes and Caveats

Pay attention to the following upgrade notes and caveats when upgrading your sensor:

- Anomaly detection has been disabled by default in IPS 7.1(2)E4 and later. If you did not configure the operation mode manually before the upgrade, it defaults to inactive after you upgrade to IPS 7.1(2)E4 or later. If you configured the operation mode to detect, learn, or inactive, the tuned value is preserved after the upgrade.
- You must have a valid maintenance contract per sensor to download software upgrades from Cisco.com.
- You must be running IPS 7.1(1)E4 to upgrade to IPS 7.1(2)E4 or later.
- This service pack automatically reboots the sensor to apply the changes. During reboot, inline network traffic is disrupted.
- You cannot uninstall IPS 7.1(*x*)E4. To revert to a previous version, you must reimage the sensor using the appropriate system image file.
- After you upgrade any IPS software on your sensor, you must restart the IDM to see the latest software features.

- You cannot use the **downgrade** command to revert to a previous major or minor version, for example, from Cisco IPS 7.1 to 7.0. You can only use the **downgrade** command to downgrade from the latest signature update or signature engine update. To revert to 7.0, you must reimage the sensor.
- You cannot downgrade the sensor using the recovery partition. To downgrade to an earlier version, you must install the appropriate system image file (.img file).
- During a signature upgrade all signature configurations are retained, both the signature tunings as well as the custom signatures. During a signature downgrade the current signature configuration is replaced with the old signature configuration. So if the last signature set had custom signatures and/or signature tunings, these are restored during the downgrade.
- All user configuration settings are lost when you install the system image. Before trying to recover the sensor by installing the system image, try to recover by using the **recover application-partition** command or by selecting the recovery partition during sensor bootup.

# Upgrades, Downgrades, and System Images

**Caution** You cannot use the **downgrade** command to revert to a previous major or minor version, for example, from Cisco IPS 7.1 to 7.0. You can only use the **downgrade** command to downgrade from the latest signature update or signature engine update. To revert to 7.0, you must reimage the sensor.

**Note** You cannot downgrade the sensor using the recovery partition. To downgrade to an earlier version, you must install the appropriate system image file (.img file).

**Note** During a signature upgrade all signature configurations are retained, both the signature tunings as well as the custom signatures. During a signature downgrade the current signature configuration is replaced with the old signature configuration. So if the last signature set had custom signatures and/or signature tunings, these are restored during the downgrade.

You can upgrade and downgrade the software on the sensor. Upgrading applies a service pack, signature update, signature engine update, minor version, major version, or recovery partition file. Downgrading removes the last applied service pack or signature update from the sensor.

You can recover the application partition image on your sensor if it becomes unusable. Using the **recover** command lets you retain your host settings while other settings revert to the factory defaults.

To install a new system image on the sensor, use ROMMON, the bootloader file, or the maintenance partition depending on which platform you have. When you install a new system image on your sensor, all accounts are removed and the default cisco account is reset to use the default password **cisco**. After installing the system image, you must initialize the sensor again.

After you reimage and initialize your sensor, upgrade your sensor with the most recent service pack, signature update, signature engine update, minor update, major update, and recovery partition files.

### For More Information

- For the procedure for initializing the sensor, see Appendix B, “Initializing the Sensor.”
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Supported FTP and HTTP/HTTPS Servers

The following FTP servers are supported for IPS software updates:

- WU-FTPD 2.6.2 (Linux)
- Solaris 2.8
- Sambar 6.0 (Windows 2000)
- Serv-U 5.0 (Windows 2000)
- MS IIS 5.0 (Windows 2000)

The following HTTP/HTTPS servers are supported for IPS software updates:

- CSM - Apache Server (Tomcat)
- CSM - Apache Server (JRun)

### For More Information

- For the procedure for downloading IPS software updates from Cisco.com, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for configuring automatic updates, see Configuring Automatic Upgrades, page D-7.

# Upgrading the Sensor

This section explains how to use the **upgrade** command to upgrade the software on the sensor. It contains the following topics:

- IPS 7.1 Upgrade Files, page D-3
- Upgrade Notes and Caveats, page D-4
- Manually Upgrading the Sensor, page D-4
- Upgrading the Recovery Partition, page D-6

## IPS 7.1 Upgrade Files

The currently supported IPS 7.1(*x*) versions are 7.1(1)E4, 7.1(2)E4, 7.1(3)E4, 7.1(4)E4, 7.1(6)E4, 7.1(7)E4, 7.1(8)E4, and 7.1(9)E4. All IPS sensors are not supported in each 7.1(*x*) version. For a list of the specific IPS filenames and the IPS versions that each sensor supports, refer to the Release Notes for your IPS version found at this URL:

http://www.cisco.com/en/US/products/hw/vpndevc/ps4077/prod_release_notes_list.html

### For More Information

For the procedure for obtaining these files on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Upgrade Notes and Caveats

For a list of the upgrade notes and caveats for each IPS version, refer to the Release Notes for your IPS version found at this URL:

http://www.cisco.com/en/US/products/hw/vpndevc/ps4077/prod_release_notes_list.html

# Manually Upgrading the Sensor

**Note** During a signature upgrade all signature configurations are retained, both the signature tunings as well as the custom signatures. During a signature downgrade the current signature configuration is replaced with the old signature configuration. So if the last signature set had custom signatures and/or signature tunings, these are restored during the downgrade.

**Caution** You must log in to Cisco.com using an account with cryptographic privileges to download software. The first time you download software on Cisco.com, you receive instructions for setting up an account with cryptographic privileges.

**Note** Do not change the filename. You must preserve the original filename for the sensor to accept the update.

Use the **upgrade** *source-url* command to apply service pack, signature update, engine update, minor version, major version, or recovery partition file upgrades. The following options apply:

- *source-url*—Specifies the location of the source file to be copied:
  - ftp:—Source URL for an FTP network server. The syntax for this prefix is:

    ftp://[[username@]location][/relativeDirectory]/filename

    ftp://[[username@]location][//absoluteDirectory]/filename

    **Note** You are prompted for a password.

  - scp:—Source URL for the SCP network server. The syntax for this prefix is:

    scp://[[username@]location][/relativeDirectory]/filename

    scp://[[username@]location][//absoluteDirectory]/filename

    **Note** You are prompted for a password. You must add the remote host to the SSH known hosts list.

  - http:—Source URL for the web server. The syntax for this prefix is:

    http://[[username@]location][/directory]/filename

    **Note** The directory specification should be an absolute path to the desired file.

– https:—Source URL for the web server. The syntax for this prefix is:

https://[[username@]location][/directory]/filename

The directory specification should be an absolute path to the desired file. The remote host must be a TLS trusted host.

### Upgrading the Sensor

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

To upgrade the sensor, follow these steps:

**Step 1** Download the appropriate file to an FTP, SCP, HTTP, or HTTPS server that is accessible from your sensor.

**Step 2** Log in to the CLI using an account with administrator privileges.

**Step 3** Enter configuration mode.

```
sensor# configure terminal
```

**Step 4** Upgrade the sensor.

```
sensor(config)# upgrade url/IPS-SSP_10-K9-7.1-3-E4.pkg
```

The URL points to where the update file is located, for example, to retrieve the update using FTP, enter the following:

```
sensor(config)# upgrade ftp://username@ip_address//directory/IPS-SSP_10-K9-7.1-3-E4.pkg
```

**Step 5** Enter the password when prompted.

```
Enter password: ********
```

**Step 6** Enter **yes** to complete the upgrade.

**Note** Major updates, minor updates, and service packs may force a restart of the IPS processes or even force a reboot of the sensor to complete installation.

**Note** The operating system is reimaged and all files that have been placed on the sensor through the service account are removed.

**Step 7** Verify your new sensor version.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
```

```
Serial Number:          123456789AB
No license present
Sensor up-time is 11 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.6M out of 171.6M bytes of available disk space (43% usage)
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96% usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0 6-0600
Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0 6-0600
Running
CollaborationApp   S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0 6-0600
Running
CLI                S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0 6-0600

Upgrade History:

  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4

Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013
sensor#
```

**For More Information**

- For a list of supported FTP and HTTP/HTTPS servers, see Supported FTP and HTTP/HTTPS Servers, page D-3.
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Upgrading the Recovery Partition

**Note** Recovery partition images are generated for major and minor updates and only in rare situations for service packs or signature updates.

**Note** You cannot downgrade the sensor using the recovery partition. To downgrade to an earlier version, you must install the appropriate system image file (.img file).

Use the **upgrade** command to upgrade the recovery partition with the most recent version so that it is ready if you need to recover the application partition on your sensor. Recovery partition images are generated for major and minor updates and only in rare situations for service packs or signature updates.

To upgrade the recovery partition on your sensor, follow these steps:

**Step 1** Download the appropriate recovery partition image file to an FTP, SCP, HTTP, or HTTPS server that is accessible from your sensor.

**Caution** Some browsers add an extension to the filename. The filename of the saved file must match what is displayed on the download page or you cannot use it to upgrade the recovery partition.

**Step 2** Log in to the CLI using an account with administrator privileges.

**Step 3** Enter configuration mode.

```
sensor# configure terminal
```

**Step 4** Upgrade the recovery partition.

```
sensor(config)#
upgrade scp://user@server_ipaddress//upgrade_path/IPS-SSP_10-K9-r-1.1-a-7.1-3-E4.pkg

sensor(config)#
upgrade ftp://user@server_ipaddress//upgrade_path/IPS-SSP_10-K9-r-1.1-a-7.1-3-E4.pkg
```

**Step 5** Enter the server password. The upgrade process begins.

**Note** This procedure only reimages the recovery partition. The application partition is not modified by this upgrade. To reimage the application partition after the recovery partition, use the **recover application-partition** command.

### For More Information

- For a list of supported FTP and HTTP/HTTPS servers, see Supported FTP and HTTP/HTTPS Servers, page D-3.
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using the **recover** command, see Upgrading the Recovery Partition, page D-6.

# Configuring Automatic Upgrades

This section describes how to configure the sensor to automatically look for upgrades in the upgrade directory. It contains the following topics:

- Understanding Automatic Upgrades, page D-8
- Automatically Upgrading the Sensor, page D-8

# Understanding Automatic Upgrades

**Caution** In IPS 7.1(5)E4 and later the default value of the Cisco server IP address has been changed from 198.133.219.25 to 72.163.4.161 in the Auto Update URL configuration. If you have automatic update configured on your sensor, you may need to update firewall rules to allow the sensor to connect to this new IP address.

You can configure the sensor to look for new upgrade files in your upgrade directory automatically. For example, several sensors can point to the same remote FTP server directory with different update schedules, such as every 24 hours, or Monday, Wednesday, and Friday at 11:00 pm.

You specify the following information to schedule automatic upgrades:

- Server IP address
- Path of the directory on the file server where the sensor checks for upgrade files
- File copy protocol (SCP or FTP)
- Username and password
- Upgrade schedule

You must download the software upgrade from Cisco.com and copy it to the upgrade directory before the sensor can poll for automatic upgrades.

### For More Information

For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Automatically Upgrading the Sensor

Use the **auto-upgrade-option enabled** command in the service host submode to configure automatic upgrades. The following options apply:

- **cisco-server**—Enables automatic signature and engine updates from Cisco.com.
- **cisco-url**—Specifies the Cisco server locater service. You do not need to change this unless the www.cisco.com IP address changes.
- **default**— Sets the value back to the system default setting.
- **directory**— Specifies the directory where upgrade files are located on the file server. A leading '/' indicates an absolute path.
- **file-copy-protocol**— Specifies the file copy protocol used to download files from the file server. The valid values are **ftp** or **scp**.

  **Note** If you use SCP, you must use the **ssh host-key** command to add the server to the SSH known hosts list so the sensor can communicate with it through SSH.

- **ip-address**—Specifies the IP address of the file server.
- **password**—Specifies the user password for Cisco server authentication.

- **schedule-option**—Specifies the schedules for when Cisco server automatic upgrades occur. Calendar scheduling starts upgrades at specific times on specific days. Periodic scheduling starts upgrades at specific periodic intervals.
  - **calendar-schedule**—Configures the days of the week and times of day that automatic upgrades will be performed.
  - **days-of-week**—Specifies the days of the week on which auto-upgrades will be performed. You can select multiple days: *sunday* through *saturday* are the valid values.
  - **no**—Removes an entry or selection setting.
  - **times-of-day**—Specifies the times of day at which auto-upgrades will begin. You can select multiple times. The valid value is *hh:mm[:ss]*.
  - **periodic-schedule**—Specifies the time that the first automatic upgrade should occur, and how long to wait between automatic upgrades.
  - **interval**—Specifies the number of hours to wait between automatic upgrades. Valid values are 0 to 8760.
  - **start-time**—Specifies the time of day to start the first automatic upgrade. The valid value is *hh:mm[:ss]*.
- **user-name**—Specifies the username for server authentication.
- **user-server**—Enables automatic upgrades from a user-defined server.

#### Configuring Automatic Upgrades

If you get an unauthorized error message while configuring an automatic update, make sure you have the correct ports open on any firewalls between the sensor and Cisco.com. For example, you need port 443 for the initial automatic update connection to www.cisco.com, and you need port 80 to download the chosen package from a Cisco file server. The IP address may change for the Cisco file server, but you can find it in the lastDownloadAttempt section in the output of the **show statistics host** command.

**Caution** In IPS 7.1(5)E4 and later the default value of the Cisco server IP address has been changed from 198.133.219.25 to 72.163.4.161 in the Auto Update URL configuration. If you have automatic update configured on your sensor, you may need to update firewall rules to allow the sensor to connect to this new IP address.

**Note** To check the status of the last automatic update or the next scheduled automatic update, run the **show statistics host** command and check the Auto Update Statistics section.

To schedule automatic upgrades, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter automatic upgrade submode.

```
sensor# configure terminal
sensor(config)# service host
sensor(config-hos)# auto-upgrade
sensor(config-hos-aut)#
```

**Step 3** Configure the sensor to automatically look for new upgrades either on Cisco.com or on your file server:

**a.** On Cisco.com. Continue with Step 4.

```
sensor(config-hos-aut)# cisco-server enabled
```

**b.** From your server.

```
sensor(config-hos-aut)# user-server enabled
```

**c.** Specify the IP address of the file server.

```
sensor(config-hos-ena)# ip-address 10.1.1.1
```

**d.** Specify the directory where the upgrade files are located on the file server.

```
sensor(config-hos-ena)# directory /tftpboot/sensor_updates
```

**e.** Specify the file server protocol.

```
sensor(config-hos-ena)# file-copy-protocol ftp
```

**Note** If you use SCP, you must use the **ssh host-key** command to add the server to the SSH known hosts list so the sensor can communicate with it through SSH.

**Step 4** Specify the username for authentication.

```
sensor(config-hos-ena)# user-name tester
```

**Step 5** Specify the password of the user.

```
sensor(config-hos-ena)# password
Enter password[]: ******
Re-enter password: ******
```

**Step 6** Specify the scheduling:

**a.** For calendar scheduling (starts upgrades at specific times on specific day):

```
sensor(config-hos-ena)# schedule-option calendar-schedule
sensor(config-hos-ena-cal)# days-of-week sunday
sensor(config-hos-ena-cal)# times-of-day 12:00:00
```

**b.** For periodic scheduling (starts upgrades at specific periodic intervals):

```
sensor(config-hos-ena)# schedule-option periodic-schedule
sensor(config-hos-ena-per)# interval 24
sensor(config-hos-ena-per)# start-time 13:00:00
```

**Step 7** Verify the settings.

```
sensor(config-hos-ena)# show settings
   enabled
   -----------------------------------------------
      schedule-option
      -----------------------------------------------
         periodic-schedule
         -----------------------------------------------
            start-time: 13:00:00
            interval: 24 hours
         -----------------------------------------------
      -----------------------------------------------
      ip-address: 10.1.1.1
      directory: /tftpboot/update/6.1_dummy_updates
```

```
        user-name: tester
        password: <hidden>
        file-copy-protocol: ftp default: scp
    ----------------------------------------------
sensor(config-hos-ena)#
```

**Step 8** Exit automatic upgrade submode.

```
sensor(config-hos-ena)# exit
sensor(config-hos)# exit
Apply Changes:?[yes]:
```

**Step 9** Press **Enter** to apply the changes or type **no** to discard them.

### For More Information

- For a list of supported FTP and HTTP/HTTPS servers, see Supported FTP and HTTP/HTTPS Servers, page D-3.
- For the procedure for adding a remote host to the trusted hosts list, for IDM refer to Defining Known Hosts Keys, for IME refer to Defining Known Host Keys, and for the CLI, refer to Adding Hosts to the SSH Known Hosts List.

# Downgrading the Sensor

**Caution** You cannot use the **downgrade** command to revert to a previous major or minor version, for example, from Cisco IPS 7.1 to 7.0. You can only use the **downgrade** command to downgrade from the latest signature update or signature engine update. To revert to 7.0, you must reimage the sensor.

**Note** You cannot downgrade the sensor using the recovery partition. To downgrade to an earlier version, you must install the appropriate system image file (.img file).

Use the **downgrade** command to remove the last applied signature upgrade or signature engine upgrade from the sensor.

To remove the last applied signature update or signature engine update from the sensor, follow these steps:

**Step 1** Log in to the sensor using an account with administrator privileges.

**Step 2** Enter global configuration mode.

```
sensor# configure terminal
```

**Step 3** If there is no recently applied service pack or signature update, the **downgrade** command is not available.

```
sensor(config)# downgrade
No downgrade available.
sensor(config)#
```

# Recovering the Application Partition

You can recover the application partition image for the sensor if it becomes unusable. Some network configuration information is retained when you use this method, which lets you have network access after the recovery is performed. Use the **recover application-partition** command to boot to the recovery partition, which automatically recovers the application partition on your sensor. If you have upgraded your recovery partition to the most recent version before you recover the application partition image, you can install the most up-to-date software image.

Because you can execute the **recover application-partition** command through a Telnet or SSH connection, we recommend using this command to recover sensors that are installed at remote locations.

**Note** When you reconnect to the sensor after recovery, you must log in with the default username and password **cisco**.

### Recovering the Application Partition Image

To recover the application partition image, follow these steps:

**Step 1** Download the recovery partition image file to an FTP, HTTP, or HTTPS server that is accessible from your sensor.

**Step 2** Log in to the CLI using an account with administrator privileges.

**Step 3** Enter configuration mode.

```
sensor# configure terminal
```

**Note** To upgrade the recovery partition the sensor must already be running IPS 7.1(3)E4.

**Step 4** Recover the application partition image.

```
sensor(config)# recover application-partition
Warning: Executing this command will stop all applications and re-image the node to
version 7.1(2)E4. All configuration changes except for network settings will be reset to
default.
Continue with recovery? []:
```

**Step 5** Enter **yes** to continue. Shutdown begins immediately after you execute the **recover** command. Shutdown can take a while, and you will still have access to the CLI, but access will be terminated without warning.

The application partition is reimaged using the image stored on the recovery partition. You must now initialize the sensor with the **setup** command.The IP address, netmask, access lists, time zone, and offset are saved and applied to the reimaged application partition. If you executed the **recover application-partition** command remotely, you can SSH to the sensor with the default username and password (**cisco**/**cisco**) and then initialize the sensor again with the **setup** command. You cannot use Telnet until you initialize the sensor because Telnet is disabled by default.

### For More Information

- For the procedure for upgrading the recovery partition to the most recent version, see Upgrading the Recovery Partition, page D-6.
- For a list of supported TFTP servers, see TFTP Servers, page D-14.
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using the **setup** command, see Appendix B, "Initializing the Sensor."

# Installing System Images

This section contains the procedures for installing system images on the appliances and modules. It contains the following topics:


- ROMMON, page D-13
- TFTP Servers, page D-14
- Connecting an Appliance to a Terminal Server, page D-14
- Installing the IPS 4270-20 System Image, page D-15
- Installing the IPS 4345 and IPS 4360 System Images, page D-17
- Installing the IPS 4510 and IPS 4520 System Image, page D-20
- Installing the ASA 5500-X IPS SSP System Image, page D-23
- Installing the ASA 5585-X IPS SSP System Image, page D-24


**Caution** All user configuration settings are lost when you install the system image. Before trying to recover the sensor by installing the system image, try to recover by using the **recover application-partition** command or by selecting the recovery partition during sensor bootup.

# ROMMON

Some Cisco sensors include a preboot CLI called ROMMON, which lets you boot images on sensors where the image on the primary device is missing, corrupt, or otherwise unable to boot the normal application. ROMMON is particularly useful for recovering remote sensors as long as the serial console port is available.

Access to ROMMON is available only through the serial console port, a Cisco-standard asynchronous RS-232C DTE available in an RJ-45F connector on the sensor chassis. The serial port is configured for 9600 baud, 8 data bits, 1 stop bit, no parity, and no flow control.

### For More Information

For the procedure for using a terminal server, see Connecting an Appliance to a Terminal Server, page D-14.

# TFTP Servers

ROMMON uses TFTP to download an image and launch it. TFTP does not address network issues such as latency or error recovery. It does implement a limited packet integrity check so that packets arriving in sequence with the correct integrity value have an extremely low probability of error. But TFTP does not offer pipelining so the total transfer time is equal to the number of packets to be transferred times the network average RTT. Because of this limitation, we recommend that the TFTP server be located on the same LAN segment as the sensor. Any network with an RTT less than a 100 milliseconds should provide reliable delivery of the image. Be aware that some TFTP servers limit the maximum file size that can be transferred to ~32 MB.

# Connecting an Appliance to a Terminal Server

A terminal server is a router with multiple, low speed, asynchronous ports that are connected to other serial devices. You can use terminal servers to remotely manage network equipment, including appliances.

To set up a Cisco terminal server with RJ-45 or hydra cable assembly connections, follow these steps:

**Step 1** Connect to a terminal server using one of the following methods:

- For terminal servers with RJ-45 connections, connect a rollover cable from the console port on the appliance to a port on the terminal server.
- For hydra cable assemblies, connect a straight-through patch cable from the console port on the appliance to a port on the terminal server.

**Step 2** Configure the line and port on the terminal server. In enable mode, enter the following configuration, where # is the line number of the port to be configured.

```
config t
line #
login
transport input all
stopbits 1
flowcontrol hardware
speed 9600
exit
exit
wr mem
```

**Step 3** Be sure to properly close a terminal session to avoid unauthorized access to the appliance. If a terminal session is not stopped properly, that is, if it does not receive an exit(0) signal from the application that initiated the session, the terminal session can remain open. When terminal sessions are not stopped properly, authentication is not performed on the next session that is opened on the serial port.

**Caution** Always exit your session and return to a login prompt before terminating the application used to establish the connection.

**Caution** If a connection is dropped or terminated by accident, you should reestablish the connection and exit normally to prevent unauthorized access to the appliance.

# Installing the IPS 4270-20 System Image

You can install the IPS 4270-20 system image by using the ROMMON on the appliance to TFTP the system image onto the compact flash device.

To install the IPS 4270-20 system image, follow these steps:

**Step 1** Download the IPS 4270-20 system image file to the tftp root directory of a TFTP server that is accessible from your IPS 4270-20.

**Note** Make sure you can access the TFTP server location from the network connected to the Ethernet port of your IPS 4270-20.

**Step 2** Boot the IPS 4270-20.

```
Booting system, please wait...
Cisco Systems ROMMON Version (1.0(12)10) #7: Thu Jun 21 13:50:04 CDT 2007

ft_id_update: Invalid ID-PROM Controller Type (0x5df)

ft_id_update: Defaulting to Controller Type (0x5c2)
```

**Note** The controller type errors are a known issue and can be disregarded.

**Step 3** Press **Break** or **Esc** at the following prompt while the system is booting to interrupt boot. Press the spacebar to begin boot immediately.

**Note** You have ten seconds to press **Break** or **Esc**.

```
Use BREAK or ESC to interrupt boot.
Use SPACE to begin boot immediately.
```

The system enters ROMMON mode. The `rommon>` prompt appears.

**Step 4** Check the current network settings.

```
rommon> set

ROMMON Variable Settings:
  ADDRESS=0.0.0.0
  SERVER=0.0.0.0
  GATEWAY=0.0.0.0
  PORT=Management0/0
  VLAN=untagged
  IMAGE=
  CONFIG=
```

```
LINKTIMEOUT=20
PKTTIMEOUT=2
RETRY=20
```

The variables have the following definitions:

- Address—Specifies the local IP address of the IPS 4270-20.
- Server—Specifies the TFTP server IP address where the application image is stored.
- Gateway—Specifies the gateway IP address used by the IPS 4270-20.
- Port—Specifies the Ethernet interface used for IPS 4270-20 management.
- VLAN—Specifies the VLAN ID number (leave as untagged).
- Image—Specifies the system image file/path name.
- Config—Unused by these platforms.

**Note** Not all values are required to establish network connectivity. The address, server, gateway, and image values are required. If you are not sure of the settings needed for your local environment, contact your system administrator.

**Step 5** If necessary, assign an IP address for the local port on the IPS 4270-20.

```
rommon> ADDRESS=ip_address
```

**Note** Use the same IP address that is assigned to the IPS 4270-20.

**Step 6** If necessary, assign the TFTP server IP address.

```
rommon> SERVER=ip_address
```

**Step 7** If necessary, assign the gateway IP address.

```
rommon> GATEWAY=ip_address
```

**Step 8** Verify that you have access to the TFTP server by pinging it from your local Ethernet port with one of the following commands:

```
rommon> ping server_ip_address
rommon> ping server
```

**Step 9** If necessary define the path and filename on the TFTP file server from which you are downloading the image.

```
rommon> IMAGE=path/file_name
```

UNIX Example

```
rommon> IMAGE=/system_images/IPS-4270_20-K9-sys-1.1-a-7.1-3-E4.img
```

**Note** The path is relative to the UNIX TFTP server default tftpboot directory. Images located in the default tftpboot directory do not have any directory names or slashes in the IMAGE specification.

Windows Example

```
rommon> IMAGE=\system_images\IPS-4270_20-K9-sys-1.1-a-7.1-3-E4.img
```

**Step 10** Enter **set** and press **Enter** to verify the network settings.

**Note** You can use the **sync** command to store these settings in NVRAM so they are maintained across boots. Otherwise, you must enter this information each time you want to boot an image from ROMMON.

**Step 11** Download and install the system image.

```
rommon> tftp
```

**Caution** To avoid corrupting the system image, do not remove power from the IPS 4270-20 while the system image is being installed.

**Note** If the network settings are correct, the system downloads and boots the specified image on the IPS 4270-20. Be sure to use the IPS 4270-20 image.

#### For More Information

- For a list of supported TFTP servers, see TFTP Servers, page D-14.
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

## Installing the IPS 4345 and IPS 4360 System Images

**Note** This procedure is for IPS 4345, but is also applicable to IPS 4360. The system image for IPS 4360 has "4360" in the filename.

You can install the IPS 4345 and IPS 4360 system image by using the ROMMON on the appliance to TFTP the system image on to the compact flash device.

To install the IPS 4345 and IPS 4360 system image, follow these steps:

**Step 1** Download the IPS 4345 system image file to the tftp root directory of a TFTP server that is accessible from your IPS 4345.

**Note** Make sure you can access the TFTP server location from the network connected to the Ethernet port of your IPS 4345.

**Step 2** Boot the IPS 4345.

```
Booting system, please wait...

CISCO SYSTEMS
Embedded BIOS Version 1.0(5)0 09/14/04 12:23:35.90
```

```
Low Memory: 631 KB
High Memory: 2048 MB
PCI Device Table.
Bus Dev Func VendID DevID Class              Irq
00  00  00   8086   2578  Host Bridge
00  01  00   8086   2579  PCI-to-PCI Bridge
00  03  00   8086   257B  PCI-to-PCI Bridge
00  1C  00   8086   25AE  PCI-to-PCI Bridge
00  1D  00   8086   25A9  Serial Bus         11
00  1D  01   8086   25AA  Serial Bus         10
00  1D  04   8086   25AB  System
00  1D  05   8086   25AC  IRQ Controller
00  1D  07   8086   25AD  Serial Bus         9
00  1E  00   8086   244E  PCI-to-PCI Bridge
00  1F  00   8086   25A1  ISA Bridge
00  1F  02   8086   25A3  IDE Controller     11
00  1F  03   8086   25A4  Serial Bus         5
00  1F  05   8086   25A6  Audio              5
02  01  00   8086   1075  Ethernet           11
03  01  00   177D   0003  Encrypt/Decrypt    9
03  02  00   8086   1079  Ethernet           9
03  02  01   8086   1079  Ethernet           9
03  03  00   8086   1079  Ethernet           9
03  03  01   8086   1079  Ethernet           9
04  02  00   8086   1209  Ethernet           11
04  03  00   8086   1209  Ethernet           5

Evaluating BIOS Options ...
Launch BIOS Extension to setup ROMMON

Cisco Systems ROMMON Version (1.0(5)0) #1: Tue Sep 14 12:20:30 PDT 2004

Platform IPS-4345-K9
Management0/0

MAC Address: 0000.c0ff.ee01
```

**Step 3** Press **Break** or **Esc** at the following prompt while the system is booting to interrupt boot. Press the spacebar to begin boot immediately.

**Note** You have ten seconds to press **Break** or **Esc**.

```
Use BREAK or ESC to interrupt boot.
Use SPACE to begin boot immediately.
```

The system enters ROMMON mode. The `rommon>` prompt appears.

**Step 4** Check the current network settings.

```
rommon> set

ROMMON Variable Settings:
      ADDRESS=0.0.0.0
      SERVER=0.0.0.0
      GATEWAY=0.0.0.0
      PORT=Management0/0
      VLAN=untagged
      IMAGE=
      CONFIG=
```

The variables have the following definitions:

- Address—Local IP address of the IPS 4345.
- Server—TFTP server IP address where the application image is stored.
- Gateway—Gateway IP address used by the IPS 4345.
- Port—Ethernet interface used for the IPS 4345 management.
- VLAN—VLAN ID number (leave as untagged).
- Image—System image file/path name.
- Config—Unused by these platforms.

**Note** Not all values are required to establish network connectivity. The address, server, gateway, and image values are required. If you are not sure of the settings needed for your local environment, contact your system administrator.

**Step 5** If necessary, change the interface used for the TFTP download.

**Note** The default interface used for TFTP downloads is Management 0/0, which corresponds to the MGMT interface of the IPS 4345.

```
rommon> PORT=interface_name
```

**Step 6** If necessary, assign an IP address for the local port on the IPS 4345.

```
rommon> ADDRESS=ip_address
```

**Note** Use the same IP address that is assigned to the IPS 4345.

**Step 7** Assign the TFTP server IP address.

```
rommon> SERVER=ip_address
```

**Step 8** If necessary, assign the gateway IP address.

```
rommon> GATEWAY=ip_address
```

**Step 9** Verify that you have access to the TFTP server by pinging it from your local Ethernet port with one of the following commands:

```
rommon> ping server_ip_address
rommon> ping server
```

**Step 10** If necessary define the path and filename on the TFTP file server from which you are downloading the image.

```
rommon> IMAGE=path file_name
```

**Caution** Make sure that you enter the **IMAGE** command in all uppercase. You can enter the other ROMMON commands in either lower case or upper case, but the **IMAGE** command specifically must be all uppercase.

UNIX Example

```
rommon> IMAGE=system_images/IPS-4345-K9-sys-1.1-a-7.1-3-E4.img
```

**Note** The path is relative to the default tftpboot directory of the UNIX TFTP server. Images located in the default tftpboot directory do not have any directory names or slashes in the IMAGE specification.

Windows Example

```
rommon> IMAGE=system_images/IPS-4345-K9-sys-1.1-a-7.1-3-E4.img
```

**Step 11** Enter **set** and press **Enter** to verify the network settings.

**Note** You can use the **sync** command to store these settings in NVRAM so they are maintained across boots. Otherwise, you must enter this information each time you want to boot an image from ROMMON.

**Step 12** Download and install the system image.

```
rommon> tftp
```

**Caution** To avoid corrupting the system image, do not remove power from the IPS 4345 while the system image is being installed.

**Note** If the network settings are correct, the system downloads and boots the specified image on the IPS 4345. Be sure to use the IPS 4345 image.

### For More Information

- For a list of supported TFTP servers, see TFTP Servers, page D-14.
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Installing the IPS 4510 and IPS 4520 System Image

**Note** The following procedure references the IPS 4510 but it also refers to the IPS 4520.

You can install the IPS 4510 and IPS 4520 system image by using the ROMMON on the appliance to TFTP the system image onto the compact flash device.

To install the IPS 4510 system image, follow these steps:

**Step 1** Download the IPS 4510 system image file to the tftp root directory of a TFTP server that is accessible from your IPS 4510.

**Note** Make sure you can access the TFTP server location from the network connected to the Management port of your IPS 4510.

**Step 2** Boot the IPS 4510.

**Step 3** Press **Break** or **Esc** at the following prompt while the system is booting to interrupt boot. Press the spacebar to begin boot immediately.

**Note** You have ten seconds to press **Break** or **Esc**.

```
Use BREAK or ESC to interrupt boot.
Use SPACE to begin boot immediately.
```

The system enters ROMMON mode. The `rommon>` prompt appears.

**Step 4** Check the current network settings.

```
rommon> set

ROMMON Variable Settings:
  ADDRESS=0.0.0.0
  SERVER=0.0.0.0
  GATEWAY=0.0.0.0
  PORT=Management0/0
  VLAN=untagged
  IMAGE=
  CONFIG=
  LINKTIMEOUT=20
  PKTTIMEOUT=2
  RETRY=20
```

The variables have the following definitions:

- Address—Specifies the local IP address of the IPS 4510.
- Server—Specifies the TFTP server IP address where the application image is stored.
- Gateway—Specifies the gateway IP address used by the IPS 4510.
- Port—Specifies the Ethernet interface used for IPS 4510 management.
- VLAN—Specifies the VLAN ID number (leave as untagged).
- Image—Specifies the system image file/path name.
- Config—Unused by these platforms.

**Note** Not all values are required to establish network connectivity. The address, server, gateway, and image values are required. If you are not sure of the settings needed for your local environment, contact your system administrator.

**Step 5** If necessary, assign an IP address for the local port on the IPS 4510.

```
rommon> ADDRESS=ip_address
```

**Note** Use the same IP address that is assigned to the IPS 4510.

**Step 6** If necessary, assign the TFTP server IP address.

```
rommon> SERVER=ip_address
```

**Step 7** If necessary, assign the gateway IP address.

```
rommon> GATEWAY=ip_address
```

**Step 8** Verify that you have access to the TFTP server by pinging it from your local Ethernet port with one of the following commands:

```
rommon> ping server_ip_address
rommon> ping server
```

**Step 9** If necessary define the path and filename on the TFTP file server from which you are downloading the image.

```
rommon> IMAGE=path/file_name
```

UNIX Example

```
rommon> IMAGE=/system_images/IPS-4510-K9-sys-1.1-a-7.1-4-E4.img
```

**Note** The path is relative to the UNIX TFTP server default tftpboot directory. Images located in the default tftpboot directory do not have any directory names or slashes in the IMAGE specification.

Windows Example

```
rommon> IMAGE=\system_images\IPS-4510-K9-sys-1.1-a-7.1-4-E4.img
```

**Step 10** Enter **set** and press **Enter** to verify the network settings.

**Note** You can use the **sync** command to store these settings in NVRAM so they are maintained across boots. Otherwise, you must enter this information each time you want to boot an image from ROMMON.

**Step 11** Download and install the system image.

```
rommon> tftp
```

**Caution** To avoid corrupting the system image, do not remove power from the IPS 4510 while the system image is being installed.

**Note** If the network settings are correct, the system downloads and boots the specified image on the IPS 4510. Be sure to use the IPS 4510 image.

### For More Information

- For a list of supported TFTP servers, see TFTP Servers, page D-14.
- For the procedure for locating software on Cisco.com, see Obtaining Cisco IPS Software, page C-1.

# Installing the ASA 5500-X IPS SSP System Image

**Note** Be sure the TFTP server that you specify can transfer files up to 60 MB in size.

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

To install the system image on the ASA 5500-X IPS SSP, follow these steps:

**Step 1** Download the IPS system image file corresponding to your ASA platform to the tftp root directory of a TFTP server that is accessible from your adaptive security appliance.

**Note** Make sure you can access the TFTP server location from the network connected to the Ethernet port of the adaptive security appliance.

**Step 2** Log in to the adaptive security appliance.

**Step 3** Enter enable mode.

```
asa> enable
```

**Step 4** Copy the IPS image to the disk0 flash of the adaptive security appliance.

```
asa# copy tftp://192.0.2.0/directory/IPS-5545-K9-sys-1.1-a-7.1-3-E4.aip disk0:
```

**Step 5** Image the ASA 5500-X IPS SSP.

```
asa# sw-module module ips recover configure image
disk0:/IPS-SSP_5545-K9-sys-1.1-a-7.1-3-E4.aip
```

**Step 6** Execute the recovery. This transfers the image from the TFTP server to the ASA 5500-X IPS SSP and restarts it.

```
asa# sw-module module ips recover boot
```

**Step 7** Periodically check the recovery until it is complete.

```
asa# show module

Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
  0 Cisco ASA 5545 Appliance with 8 GE ports, 1  ASA5545            ABC1234D56E
  1 IPS 5545 Intrusion Protection System         IPS5545            ABC1234D56E

Mod  MAC Address Range                 Hw Version   Fw Version   Sw Version
---  --------------------------------- ------------ ------------ --------------
0    503d.e59c.6dc1 to 503d.e59c.6dca  1.0                       8.6.1
ips  503d.e59c.6dcb to 503d.e59c.6dcb  N/A          N/A          7.1(3)E4

Mod SSM Application Name           Status           SSM Application Version
--- ------------------------------ ---------------- --------------------------
  1 IPS                            Up               7.1(3)E4

Mod Status             Data Plane Status     Compatibility
--- ------------------ --------------------- -------------
  0 Up Sys             Not Applicable
  1 Up                 Up

asa#
```

**Note** The Status field in the output indicates the operational status of the ASA 5500-X IPS SSP. An ASA 5500-X IPS SSP operating normally shows a status of "Up." While the adaptive security appliance transfers an application image to the ASA 5500-X IPS SSP, the Status field in the output reads "Recover." When the adaptive security appliance completes the image transfer and restarts the ASA 5500-X IPS SSP, the newly transferred image is running.

**Note** To debug any errors that may happen in the recovery process, use the **debug module-boot** command to enable debugging of the system reimaging process.

**Step 8** Session to the ASA 5500-X IPS SSP and initialize it with the **setup** command.

### For More Information

- For a list of recommended TFTP servers, see TFTP Servers, page D-14.
- For the procedure for initializing the ASA 5500-X IPS SSP with the **setup** command, see Advanced Setup for the ASA 5500-X IPS SSP, page B-17.

# Installing the ASA 5585-X IPS SSP System Image

This section describes how to install the ASA 5585-X IPS SSP system image using the **hw-module** command or ROMMON, and contains the following topics:

- Installing the ASA 5585-X IPS SSP System Image Using the hw-module Command, page D-25
- Installing the ASA 5585-X IPS SSP System Image Using ROMMON, page D-27

## Installing the ASA 5585-X IPS SSP System Image Using the hw-module Command

**Note** Be sure the TFTP server that you specify can transfer files up to 60 MB in size.

**Note** This process can take approximately 15 minutes to complete, depending on your network and the size of the image.

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

To install the system image, transfer the software image from a TFTP server to the ASA 5585-X IPS SSP using the adaptive security appliance CLI. The adaptive security appliance can communicate with the ROMMON application of the ASA 5585-X IPS SSP to transfer the image.

To install the ASA 5585-X IPS SSP software image, follow these steps:

**Step 1** Download the ASA 5585-X IPS SSP system image file to the tftp root directory of a TFTP server that is accessible from your adaptive security appliance.

**Note** Make sure you can access the TFTP server location from the network connected to the Ethernet port of your adaptive security appliance.

**Step 2** Log in to the adaptive security appliance.

**Step 3** Enter enable mode.

```
asa# enable
```

**Step 4** Configure the recovery settings for the ASA 5585-X IPS SSP.

```
asa (enable)# hw-module module 1 recover configure
```

**Note** If you make an error in the recovery configuration, use the **hw-module module 1 recover stop** command to stop the system reimaging and then you can correct the configuration.

**Step 5** Specify the TFTP URL for the software image.

```
Image URL [tftp://0.0.0.0/]:
```

Example

```
Image URL [tftp://0.0.0.0/]: tftp://192.0.2.0/IPS-SSP_40-K9-sys-1.1-a-7.1-3-E4.img
```

**Step 6** Specify the command and control interface of the ASA 5585-X IPS SSP.

**Note** The port IP address is the management IP address of the ASA 5585-X IPS SSP.

```
Port IP Address [0.0.0.0]:
```

Example

```
Port IP Address [0.0.0.0]: 10.89.149.231
```

**Step 7** Leave the VLAN ID at 0.

```
VLAN ID [0]:
```

**Step 8** Specify the default gateway of the ASA 5585-X IPS SSP.

```
Gateway IP Address [0.0.0.0]:
```

Example

```
Gateway IP Address [0.0.0.0]: 10.89.149.254
```

**Step 9** Execute the recovery. This transfers the software image from the TFTP server to the ASA 5585-X IPS SSP and restarts it.

```
asa# hw-module module 1 recover boot
```

**Step 10** Periodically check the recovery until it is complete.

**Note** The status reads `Recovery` during recovery and reads `Up` when installation is complete.

```
asa# show module 1 details
Getting details from the Service Module, please wait...
ASA 5585-X IPS Security Services Processor-10 with 8GE
Model:              ASA5585-SSP-IPS40
Hardware version:   1.0
Serial Number:      JAF1350ABSL
Firmware version:   2.0(1)3
Software version:   7.1(3)E4
MAC Address Range:  8843.e12f.5414 to 8843.e12f.541f
App. name:          IPS
App. Status:        Up
App. Status Desc:   Normal Operation
App. version:       7.1(3)E4
Data plane Status:  Up
Status:             Up
Mgmt IP addr:       192.0.2.0
Mgmt Network mask:  255.255.255.0
Mgmt Gateway:       10.89.148.254
Mgmt Access List:   10.0.0.0/8
Mgmt Access List:   64.0.0.0/8
Mgmt web ports:     443
Mgmt TLS enabled    true
asa#
```

**Note** The Status field in the output indicates the operational status of the ASA 5585-X IPS SSP. An ASA 5585-X IPS SSP operating normally shows a status of "Up." While the adaptive security appliance transfers the software image to the ASA 5585-X IPS SSP, the Status field in the output reads "Recover." When the adaptive security appliance completes the software image transfer and restarts the ASA 5585-X IPS SSP, the newly transferred image is running.

**Note** To debug any errors that may happen during this process, use the **debug module-boot** command to enable debugging of the software installation process.

**Step 11** Session to the ASA 5585-X IPS SSP.

**Step 12** Enter `cisco` three times and your new password twice.

**Step 13** Initialize the ASA 5585-X IPS SSP with the **setup** command.

**For More Information**

- For a list of recommended TFTP servers, see TFTP Servers, page D-14.
- For the procedure for initializing the ASA 5585-X IPS SSP with the **setup** command, see Advanced Setup for the ASA 5585-X IPS SSP, page B-21.

## Installing the ASA 5585-X IPS SSP System Image Using ROMMON

You can install the ASA 5585-X IPS SSP system image by using the ROMMON on the adaptive security appliance to TFTP the system image onto the ASA 5585-X IPS SSP.

To install the ASA 5585-X IPS SSP system image, follow these steps:

**Step 1** Download the ASA 5585-X IPS SSP system image file to the tftp root directory of a TFTP server that is accessible from your adaptive security appliance.

**Note** Make sure you can access the TFTP server location from the network connected to the Ethernet port of your adaptive security appliance.

**Step 2** Boot the ASA 5585-X IPS SSP.

```
Booting system, please wait...

CISCO SYSTEMS
Embedded BIOS Version 0.0(2)10 11:16:38 04/15/10
Com KbdBuf SMM UsbHid Msg0 Prompt Pmrt Cache1 LowM ExtM HugeM Cache2 Flg Siz0 Amrt PMM
PnpDsp Smbios Lpt0 Npx1 Apm Lp1 Acpi Typ Dbg Enb Mp MemReduce MemSync1 CallRoms MemSync2
DriveInit


Total memory : 12 GB
Total number of CPU cores : 8
Com Lp1 Admgr2 Brd10 Plx2 OEM0=7EFF5C74
Cisco Systems ROMMON Version (1.0(12)10) #0: Thu Apr 8 00:12:33 CDT 2010

Use BREAK or ESC to interrupt boot.
Use SPACE to begin boot immediately.
Boot interrupted.

Management0/0
Link is UP
MAC Address: 5475.d029.7fa9
```

**Step 3** Press **Break** or **Esc** at the following prompt while the system is booting to interrupt boot. Press the spacebar to begin boot immediately.

**Note** You have ten seconds to press **Break** or **Esc**.

```
Use BREAK or ESC to interrupt boot.
```

```
Use SPACE to begin boot immediately.
```

The system enters ROMMON mode. The `rommon>` prompt appears.

**Step 4** Check the current network settings.

```
rommon #0> set
ROMMON Variable Settings:
  ADDRESS=0.0.0.0
  SERVER=0.0.0.0
  GATEWAY=0.0.0.0
  PORT=Management0/0
  VLAN=untagged
  IMAGE=
  CONFIG=
  LINKTIMEOUT=20
  PKTTIMEOUT=4
  RETRY=20
```

The variables have the following definitions:

- Address—Specifies the local IP address of the ASA 5585-X IPS SSP.
- Server—Specifies the TFTP server IP address where the application image is stored.
- Gateway—Specifies the gateway IP address used by the ASA 5585-X IPS SSP.
- Port—Specifies the ethernet interface used for the ASA 5585-X IPS SSP management.
- VLAN—Specifies the VLAN ID number (leave as untagged).
- Image—Specifies the system image file/path name.
- Config—Specifies the unused by these platforms.

**Note** Not all values are required to establish network connectivity. The address, server, gateway, and image values are required. If you are not sure of the settings needed for your local environment, contact your system administrator.

**Step 5** If necessary, change the interface used for the TFTP download.

**Note** The default interface used for TFTP downloads is Management 0/0, which corresponds to the management interface of the ASA 5585-X IPS SSP.

```
rommon> PORT=interface_name
```

**Step 6** If necessary, assign an IP address for the local port on the ASA 5585-X IPS SSP.

```
rommon> ADDRESS=ip_address
```

**Note** Use the same IP address that is assigned to the ASA 5585-X IPS SSP.

**Step 7** If necessary, assign the TFTP server IP address.

```
rommon> SERVER=ip_address
```

**Step 8** If necessary, assign the gateway IP address.

```
rommon> GATEWAY=ip_address
```

**Step 9** Verify that you have access to the TFTP server by pinging it from your local Ethernet port with one of the following commands.

```
rommon> ping server_ip_address
rommon> ping server
```

**Step 10** If necessary define the path and filename on the TFTP file server from which you are downloading the image.

```
rommon> IMAGE=path/file_name
```

**Caution** Make sure that you enter the **IMAGE** command in all uppercase. You can enter the other ROMMON commands in either lower case or upper case, but the **IMAGE** command specifically must be all uppercase.

UNIX Example

```
rommon> IMAGE=/system_images/IPS-SSP_10-K9-sys-1.1-a-7.1-3-E4.img
```

**Note** The path is relative to the default tftpboot directory of the UNIX TFTP server. Images located in the default tftpboot directory do not have any directory names or slashes in the IMAGE specification.

Windows Example

```
rommon> IMAGE=\system_images\IPS-SSP_10-K9-sys-1.1-a-7.1-3-E4.img
```

**Step 11** Enter **set** and press **Enter** to verify the network settings.

**Note** You can use the **sync** command to store these settings in NVRAM so they are maintained across boots. Otherwise, you must enter this information each time you want to boot an image from ROMMON.

**Step 12** Download and install the system image.

```
rommon> tftp
```

**Note** If the network settings are correct, the system downloads and boots the specified image on the ASA 5585-X IPS SSP. Be sure to use the ASA 5585-X IPS SSP image.

**Caution** To avoid corrupting the system image, do not remove power from the ASA 5585-X IPS SSP while the system image is being installed.

### For More Information

- For a list of recommended TFTP servers, see TFTP Servers, page D-14.
- For the procedure for initializing the ASA 5585-X IPS SSP with the **setup** command, see Advanced Setup for the ASA 5585-X IPS SSP, page B-21.

# Troubleshooting

## Contents

This appendix contains troubleshooting tips and procedures for sensors and software. It contains the following sections:


- Cisco Bug Search, page E-2
- Preventive Maintenance, page E-2
- Disaster Recovery, page E-6
- Recovering the Password, page E-7
- Time Sources and the Sensor, page E-15
- Advantages and Restrictions of Virtualization, page E-17
- Supported MIBs, page E-18
- When to Disable Anomaly Detection, page E-19
- Troubleshooting Global Correlation, page E-19
- Analysis Engine Not Responding, page E-20
- Troubleshooting RADIUS Authentication, page E-21
- Troubleshooting External Product Interfaces, page E-21
- Troubleshooting the Appliance, page E-22
- Troubleshooting the IDM, page E-55
- Troubleshooting the IME, page E-57
- Troubleshooting the ASA 5500 AIP SSM, page E-59
- Troubleshooting the ASA 5500-X IPS SSP, page E-64
- Troubleshooting the ASA 5585-X IPS SSP, page E-70
- Gathering Information, page E-77

# Cisco Bug Search

Bug Search Tool (BST), the online successor to Bug Toolkit, is designed to improve your effectiveness in network risk management and device troubleshooting.

BST allows partners and customers to search for software bugs based on product, release, and keyword, and aggregates key data such as bug details, product, and version. The service has provision to filter bugs based on credentials to provide external and internal bug views for the search input.

Check out Bug Search Tools & Resources on Cisco.com. For more details on the tool overview and functionalities, check out the help page, located at
http://www.cisco.com/web/applicat/cbsshelp/help.html

# Preventive Maintenance

This section describes how to perform preventive maintenance for your sensor, and contains the following topics:


- Understanding Preventive Maintenance, page E-2
- Creating and Using a Backup Configuration File, page E-3
- Backing Up and Restoring the Configuration File Using a Remote Server, page E-3
- Creating the Service Account, page E-5


## Understanding Preventive Maintenance

The following actions will help you maintain your sensor:

- Back up a good configuration. If your current configuration becomes unusable, you can replace it with the backup version.
- Save your backup configuration to a remote system.
- Always back up your configuration before you do a manual upgrade. If you have auto upgrades configured, make sure you do periodic backups.
- Create a service account. A service account is needed for special debug situations directed by TAC.

**Caution** You should carefully consider whether you want to create a service account. The service account provides shell access to the system, which makes the system vulnerable. Analyze your situation to decide if you want a service account existing on the system.

### For More Information

- For the procedure for backing up a configuration file, see Creating and Using a Backup Configuration File, page E-3.
- For the procedure for using a remote server to copy and restore the a configuration file, see Backing Up and Restoring the Configuration File Using a Remote Server, page E-3.
- For more information about the service account, see Creating the Service Account, page E-5.

# Creating and Using a Backup Configuration File

To protect your configuration, you can back up the current configuration and then display it to confirm that is the configuration you want to save. If you need to restore this configuration, you can merge the backup configuration file with the current configuration or overwrite the current configuration file with the backup configuration file.

To back up your current configuration, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Save the current configuration. The current configuration is saved in a backup file.

```
sensor# copy current-config backup-config
```

**Step 3** Display the backup configuration file. The backup configuration file is displayed.

```
sensor# more backup-config
```

**Step 4** You can either merge the backup configuration with the current configuration, or you can overwrite the current configuration:

- Merge the backup configuration into the current configuration.

  ```
  sensor# copy backup-config current-config
  ```

- Overwrite the current configuration with the backup configuration.

  ```
  sensor# copy /erase backup-config current-config
  ```

# Backing Up and Restoring the Configuration File Using a Remote Server

**Note** We recommend copying the current configuration file to a remote server before upgrading.

Use the **copy** [**/erase**] *source_url destination_url keyword* command to copy the configuration file to a remote server. You can then restore the current configuration from the remote server. You are prompted to back up the current configuration first. The following options apply:

- **/erase**—Erases the destination file before copying.

  This keyword only applies to the current-config; the backup-config is always overwritten. If this keyword is specified for destination current-config, the source configuration is applied to the system default configuration. If it is not specified for the destination current-config, the source configuration is merged with the current-config.

- *source_url*—The location of the source file to be copied. It can be a URL or keyword.
- *destination_url*—The location of the destination file to be copied. It can be a URL or a keyword.
- **current-config**—The current running configuration. The configuration becomes persistent as the commands are entered.
- **backup-config**—The storage location for the configuration backup.

The exact format of the source and destination URLs varies according to the file. Here are the valid types:

- ftp:—Source or destination URL for an FTP network server. The syntax for this prefix is:

  ftp://[[username@] location]/relativeDirectory]/filename

  ftp://[[username@]location]//absoluteDirectory]/filename
- scp:—Source or destination URL for the SCP network server. The syntax for this prefix is:

  scp://[[username@] location]/relativeDirectory]/filename

  scp://[[username@] location]//absoluteDirectory]/filename

**Note** If you use FTP or SCP protocol, you are prompted for a password. If you use SCP protocol, you must also add the remote host to the SSH known hosts list.

- http:—Source URL for the web server. The syntax for this prefix is:

  http://[[username@]location]/directory]/filename
- https:—Source URL for the web server. The syntax for this prefix is:

  https://[[username@]location]/directory]/filename

**Note** HTTP and HTTPS prompt for a password if a username is required to access the website. If you use HTTPS protocol, the remote host must be a TLS trusted host.

**Caution** Copying a configuration file from another sensor may result in errors if the sensing interfaces and virtual sensors are not configured the same.

### Backing Up the Current Configuration to a Remote Server

To back up your current configuration to a remote server, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Back up the current configuration to the remote server.

```
sensor# copy current-config scp://user@192.0.2.0//configuration/cfg current-config
Password: ********
Warning: Copying over the current configuration may leave the box in an unstable state.
Would you like to copy current-config to backup-config before proceeding? [yes]:
```

**Step 3** Enter **yes** to copy the current configuration to a backup configuration.

```
cfg            100% |***********************************************| 36124       00:00
```

### Restoring the Current Configuration From a Backup File

To restore your current configuration from a backup file, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Back up the current configuration to the remote server.

```
sensor# copy scp://user@192.0.2.0//configuration/cfg current-config
Password: ********
Warning: Copying over the current configuration may leave the box in an unstable state.
Would you like to copy current-config to backup-config before proceeding? [yes]:
```

**Step 3** Enter **yes** to copy the current configuration to a backup configuration.

```
cfg            100% |*********************************************| 36124       00:00

Warning: Replacing existing network-settings may leave the box in an unstable state.
Would you like to replace existing network settings
(host-ipaddress/netmask/gateway/access-list) on sensor before proceeding? [no]:
sensor#
```

**Step 4** Enter **no** to retain the currently configured hostname, IP address, subnet mask, management interface, and access list. We recommend you retain this information to preserve access to your sensor after the rest of the configuration has been restored.

### For More Information

For a list of supported HTTP/HTTPS servers, see Supported FTP and HTTP/HTTPS Servers, page D-3.

# Creating the Service Account

You can create a service account for TAC to use during troubleshooting. Although more than one user can have access to the sensor, only one user can have service privileges on a sensor. The service account is for support purposes only.

The root user password is synchronized to the service account password when the service account is created. To gain root access you must log in with the service account and switch to user root with the **su - root** command.

**Caution** Do not make modifications to the sensor through the service account except under the direction of TAC. If you use the service account to configure the sensor, your configuration is not supported by TAC. Adding services to the operating system through the service account affects proper performance and functioning of the other IPS services. TAC does not support a sensor on which additional services have been added.

**Caution** You should carefully consider whether you want to create a service account. The service account provides shell access to the system, which makes the system vulnerable. However, you can use the service account to create a password if the administrator password is lost. Analyze your situation to decide if you want a service account existing on the system.

**Note** For IPS 5.0 and later, you can no longer remove the **cisco** account. You can disable it using the **no password cisco** command, but you cannot remove it. To use the **no password cisco** command, there must be another administrator account on the sensor. Removing the **cisco** account through the service account is not supported. If you remove the **cisco** account through the service account, the sensor most likely will not boot up, so to recover the sensor you must reinstall the sensor system image.

To create the service account, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter configuration mode.

```
sensor# configure terminal
```

**Step 3** Specify the parameters for the service account. The username follows the pattern ^[A-Za-z0-9()+:,_/-]+$, which means the username must start with a letter or number, and can include any letter A to Z (capital or small), any number 0 to 9, - and _, and can contain 1 to 64 characters.

```
sensor(config)# user username privilege service
```

**Step 4** Specify a password when prompted. A valid password is 8 to 32 characters long. All characters except space are allowed. If a service account already exists for this sensor, the following error is displayed and no service account is created.

```
Error: Only one service account may exist
```

**Step 5** Exit configuration mode.

```
sensor(config)# exit
sensor#
```

When you use the service account to log in to the CLI, you receive this warning.

```
************************ WARNING ****************************************************
UNAUTHORIZED ACCESS TO THIS NETWORK DEVICE IS PROHIBITED. This account is intended to be
used for support and troubleshooting purposes only. Unauthorized modifications are not
supported and will require this device to be reimaged to guarantee proper operation.
*************************************************************************************
```

# Disaster Recovery

Follow these recommendations so that you are ready in case of a disaster:

- If you are using the CLI, IDM, or IME for configuration, copy the current configuration from the sensor to an FTP or SCP server any time a change has been made.
- You should note the specific software version for that configuration. You can apply the copied configuration only to a sensor of the same version.
- You also need the list of user IDs that have been used on that sensor. The list of user IDs and passwords are not saved in the configuration.

When a disaster happens and you need to recover the sensor, try the following:

1. Reimage the sensor.

2. Log in to the sensor with the default user ID and password—**cisco**.

**Note** You are prompted to change the **cisco** password.

3. Initialize the sensor.
4. Upgrade the sensor to the IPS software version it had when the configuration was last saved and copied.

**Warning** **Trying to copy the saved configuration without getting the sensor back to the same IPS software version it had before the disaster can cause configuration errors.**

5. Copy the last saved configuration to the sensor.
6. Update clients to use the new key and certificate of the sensor. Reimaging changes the sensor SSH keys and HTTPS certificate, so you must add the hosts back to the SSN known hosts list.
7. Create previous users.

### For More Information

- For the procedure for backing up a configuration file, see Creating and Using a Backup Configuration File, page E-3.
- For the procedures for reimaging a sensor, see Chapter D, "Upgrading, Downgrading, and Installing System Images."
- For the procedure for using the **setup** command to initialize the sensor, see Appendix B, "Initializing the Sensor."
- For more information on obtaining IPS software and how to install it, see Obtaining Cisco IPS Software, page C-1.
- For the procedure for using a remote server to copy and restore the a configuration file, see Backing Up and Restoring the Configuration File Using a Remote Server, page E-3.
- For the procedure for adding hosts to the SSH known hosts list, refer to Adding Hosts to the SSH Known Hosts Lists.
- For the procedure for adding users and obtaining a list of the current users on the sensor, refer to Configuring User Parameters.

# Recovering the Password

For most IPS platforms, you can now recover the password on the sensor rather than using the service account or reimaging the sensor. This section describes how to recover the password for the various IPS platforms. It contains the following topics:

- Understanding Password Recovery, page E-8
- Recovering the Password for the Appliance, page E-8
- Recovering the ASA 5500-X IPS SSP Password, page E-10
- Recovering the ASA 5585-X IPS SSP Password, page E-12
- Disabling Password Recovery, page E-13
- Verifying the State of Password Recovery, page E-14

- Troubleshooting Password Recovery, page E-15

# Understanding Password Recovery

**Note** Administrators may need to disable the password recovery feature for security reasons.

Password recovery implementations vary according to IPS platform requirements. Password recovery is implemented only for the cisco administrative account and is enabled by default. The IPS administrator can then recover user passwords for other accounts using the CLI. The cisco user password reverts to **cisco** and must be changed after the next login.

Table E-1 lists the password recovery methods according to platform.

***Table E-1 Password Recovery Methods According to Platform***

| Platform | Description | Recovery Method |
|---|---|---|
| 4300 series sensors<br>4500 series sensors | Standalone IPS appliances | GRUB prompt or ROMMON |
| ASA 5500-X IPS SSP<br>ASA 5585-X IPS SSP | ASA 5500 series adaptive security appliance IPS modules | Adaptive security appliance CLI command |

# Recovering the Password for the Appliance

This section describes the two ways to recover the password for appliances. It contains the following topics:

- Using the GRUB Menu, page E-8
- Using ROMMON, page E-9

## Using the GRUB Menu

**Note** You must have a terminal server or direct serial connection to the appliance to use the GRUB menu to recover the password.

For the IPS 4270-20, IPS 4345, IPS 4360, IPS 4510, and IPS 4520 appliances, the password recovery is found in the GRUB menu, which appears during bootup. When the GRUB menu appears, press any key to pause the boot process.

To recover the password on appliances, follow these steps:

**Step 1** Reboot the appliance to see the GRUB menu.

```
GNU GRUB version 0.94 (632K lower / 523264K upper memory)
------------------------------------------
0: Cisco IPS
1: Cisco IPS Recovery
2: Cisco IPS Clear Password (cisco)
------------------------------------------
```

```
Use the ^ and v keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
Commands before booting, or 'c' for a command-line.

Highlighted entry is 0:
```

**Step 2** Press any key to pause the boot process.

**Step 3** Choose **2: Cisco IPS Clear Password (cisco)**. The password is reset to **cisco**. Log in to the CLI with username **cisco** and password **cisco**. You can then change the password.

## Using ROMMON

For the IPS 4345, IPS 4360, IPS 4510, and IPS 4520, you can use the ROMMON to recover the password. To access the ROMMON CLI, reboot the sensor from a terminal server or direct connection and interrupt the boot process.

**Note** After recovering the password, you must reset the confreg to **0**, otherwise, when you try to upgrade the sensor, the upgrade fails because when the sensor reboots, it goes to password recovery (**confreg 0x7**) rather than to the upgrade option.

To recover the password using the ROMMON CLI, follow these steps:

**Step 1** Reboot the appliance.

**Step 2** To interrupt the boot process, press **ESC** or **Control-R** (terminal server) or send a **BREAK** command (direct connection). The boot code either pauses for 10 seconds or displays something similar to one of the following:

- `Evaluating boot options`
- `Use BREAK or ESC to interrupt boot`

**Step 3** Enter the following commands to reset the password:

```
confreg 0x7
boot
```

Sample ROMMON session:

```
Booting system, please wait...
CISCO SYSTEMS
Embedded BIOS Version 1.0(11)2 01/25/06 13:21:26.17
...
Evaluating BIOS Options...
Launch BIOS Extension to setup ROMMON
Cisco Systems ROMMON Version (1.0(11)2) #0: Thu Jan 26 10:43:08 PST 2006
Platform IPS-4360-K9
Use BREAK or ESC to interrupt boot.
Use SPACE to begin boot immediately.
Boot interrupted.
Management0/0
Link is UP
MAC Address:000b.fcfa.d155
Use ? for help.
rommon #0> confreg 0x7
Update Config Register (0x7) in NVRAM...
```

```
rommon #1> boot
```

**Step 4** Enter the following command to reset the confreg value to 0:

```
confreg 0
```

# Recovering the ASA 5500-X IPS SSP Password

You can reset the password to the default (**cisco**) for the ASA 5500-X IPS SSP using the CLI or the ASDM. Resetting the password causes it to reboot. IPS services are not available during a reboot.

**Note** To reset the password, you must have ASA 8.6.1 or later.

Use the **sw-module module ips password-reset** command to reset the password to the default **cisco**. If the module in the specified slot has an IPS version that does not support password recovery, the following error message is displayed:

```
ERROR: the module in slot <n> does not support password recovery.
```

To reset the password on the ASA 5500-X IPS SSP, follow these steps:

**Step 1** Log into the adaptive security appliance and enter the following command:

```
asa# sw-module module ips password-reset
Reset the password on module ips? [confirm]
```

**Step 2** Press **Enter** to confirm.

```
Password-Reset issued for module ips.
```

**Step 3** Verify the status of the module. Once the status reads `Up`, you can session to the ASA 5500-X IPS SSP.

```
asa# show module ips
Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
ips ASA 5555-X IPS Security Services Processor   ASA5555-IPS        FCH151070GR

Mod MAC Address Range                 Hw Version   Fw Version   Sw Version
--- --------------------------------- ------------ ------------ ---------------
ips 503d.e59c.7c4c to 503d.e59c.7c4c  N/A          N/A          7.1(4)E4

Mod SSM Application Name           Status           SSM Application Version
--- ------------------------------ ---------------- --------------------------
ips IPS                            Up               7.1(4)E4

Mod Status             Data Plane Status     Compatibility
--- ------------------ --------------------- -------------
ips Up                 Up

Mod License Name   License Status  Time Remaining
--- -------------- --------------- ---------------
ips IPS Module     Enabled         210 days
```

**Step 4** Session to the ASA 5500-X IPS SSP.

```
asa# session ips
Opening command session with module ips.
```

```
Connected to module ips. Escape character sequence is 'CTRL-^X'.
```

**Step 5** Enter the default username (**cisco**) and password (**cisco**) at the login prompt.

```
login: cisco
Password: cisco

You are required to change your password immediately (password aged)
Changing password for cisco.
(current) password: cisco
```

**Step 6** Enter your new password twice.

```
New password: new password
Retype new password: new password

***NOTICE***
This product contains cryptographic features and is subject to United States and local
country laws governing import, export, transfer and use. Delivery of Cisco cryptographic
products does not imply third-party authority to import, export, distribute or use
encryption. Importers, exporters, distributors and users are responsible for compliance
with U.S. and local country laws. By using this product you agree to comply with
applicable laws and regulations. If you are unable to comply with U.S. and local laws,
return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.

***LICENSE NOTICE***
There is no license key installed on this IPS platform. The system will continue to
operate with the currently installed signature set. A valid license must be obtained in
order to apply signature updates. Please go to http://www.cisco.com/go/license to obtain a
new license or install a license.

asa-ssp#
```

### Using the ASDM

To reset the password in the ASDM, follow these steps:

**Step 1** From the ASDM menu bar, choose **Tools > IPS Password Reset**.

**Note** This option does not appear in the menu if there is no IPS present.

**Step 2** In the IPS Password Reset confirmation dialog box, click **OK** to reset the password to the default (**cisco**). A dialog box displays the success or failure of the password reset. If the reset fails, make sure you have the correct ASA and IPS software versions.

**Step 3** Click **Close** to close the dialog box. The sensor reboots.

# Recovering the ASA 5585-X IPS SSP Password

**Note** To reset the password, you must have ASA 8.2.(4.4) or later or ASA 8.4.2 or later. The ASA 5585-X IPS SSP is not supported in ASA 8.3(*x*).

You can reset the password to the default (**cisco**) for the ASA 5585-X IPS SSP using the CLI or the ASDM. Resetting the password causes it to reboot. IPS services are not available during a reboot.

Use the **hw-module module** *slot_number* **password-reset** command to reset the password to the default **cisco**. If the module in the specified slot has an IPS version that does not support password recovery, the following error message is displayed:

```
ERROR: the module in slot <n> does not support password recovery.
```

To reset the password on the ASA 5585-X IPS SSP, follow these steps:

**Step 1** Log into the adaptive security appliance and enter the following command:

```
asa# hw-module module 1 password-reset
Reset the password on module in slot 1? [confirm]
```

**Step 2** Press **Enter** to confirm.

```
Password-Reset issued for slot 1.
```

**Step 3** Verify the status of the module. Once the status reads `Up`, you can session to the ASA 5585-X IPS SSP.

```
asa# show module 1
Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
  1 ASA 5585-X IPS Security Services Processor-4 ASA5585-SSP-IPS40  JAF1436ABSG

Mod MAC Address Range                 Hw Version   Fw Version   Sw Version
--- --------------------------------- ------------ ------------ ---------------
  1 5475.d029.8c74 to 5475.d029.8c7f  0.1          2.0(12)3     7.1(4)E4

Mod SSM Application Name           Status           SSM Application Version
--- ------------------------------ ---------------- --------------------------
  1 IPS                            Up               7.1(4)E4

Mod Status             Data Plane Status     Compatibility
--- ------------------ --------------------- -------------
  1 Up                 Up
```

**Step 4** Session to the ASA 5585-X IPS SSP.

```
asa# session 1
Opening command session with slot 1.
Connected to slot 1. Escape character sequence is 'CTRL-^X'.
```

**Step 5** Enter the default username (**cisco**) and password (**cisco**) at the login prompt.

```
login: cisco
Password: cisco

You are required to change your password immediately (password aged)
Changing password for cisco.
(current) password: cisco
```

**Step 6** Enter your new password twice.

```
New password: new password
Retype new password: new password

***NOTICE***
This product contains cryptographic features and is subject to United States and local
country laws governing import, export, transfer and use. Delivery of Cisco cryptographic
products does not imply third-party authority to import, export, distribute or use
encryption. Importers, exporters, distributors and users are responsible for compliance
with U.S. and local country laws. By using this product you agree to comply with
applicable laws and regulations. If you are unable to comply with U.S. and local laws,
return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.

***LICENSE NOTICE***
There is no license key installed on this IPS platform. The system will continue to
operate with the currently installed signature set. A valid license must be obtained in
order to apply signature updates. Please go to http://www.cisco.com/go/license to obtain a
new license or install a license.
ips_ssp#
```

### Using the ASDM

To reset the password in the ASDM, follow these steps:

**Step 1** From the ASDM menu bar, choose **Tools > IPS Password Reset**.

**Note** This option does not appear in the menu if there is no IPS present.

**Step 2** In the IPS Password Reset confirmation dialog box, click **OK** to reset the password to the default (**cisco**). A dialog box displays the success or failure of the password reset. If the reset fails, make sure you have the correct ASA and IPS software versions.

**Step 3** Click **Close** to close the dialog box. The sensor reboots.

## Disabling Password Recovery

**Caution** If you try to recover the password on a sensor on which password recovery is disabled, the process proceeds with no errors or warnings; however, the password is not reset. If you cannot log in to the sensor because you have forgotten the password, and password recovery is set to disabled, you must reimage your sensor.

Password recovery is enabled by default. You can disable password recovery through the CLI, IDM, or IME.

### Disabling Password Recovery Using the CLI

To disable password recovery in the CLI, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter global configuration mode.

```
sensor# configure terminal
```

**Step 3** Enter host mode.

```
sensor(config)# service host
```

**Step 4** Disable password recovery.

```
sensor(config-hos)# password-recovery disallowed
```

### Disabling Password Recovery Using the IDM or IME

To disable password recovery in the IDM or IME, follow these steps:

**Step 1** Log in to the IDM or IME using an account with administrator privileges.

**Step 2** Choose **Configuration > *sensor_name* > Sensor Setup > Network**.

**Step 3** To disable password recovery, uncheck the **Allow Password Recovery** check box.

## Verifying the State of Password Recovery

Use the **show settings | include password** command to verify whether password recovery is enabled. To verify whether password recovery is enabled, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Enter service host submode.

```
sensor# configure terminal
sensor (config)# service host
sensor (config-hos)#
```

**Step 3** Verify the state of password recovery by using the **include** keyword to show settings in a filtered output.

```
sensor(config-hos)# show settings | include password
   password-recovery: allowed <defaulted>
sensor(config-hos)#
```

## Troubleshooting Password Recovery

When you troubleshoot password recovery, pay attention to the following:

- You cannot determine whether password recovery has been disabled in the sensor configuration from the ROMMON prompt, GRUB menu, switch CLI, or router CLI. If you attempt password recovery, it always appears to succeed. If it has been disabled, the password is not reset to **cisco**. The only option is to reimage the sensor.
- You can disable password recovery in the host configuration. For the platforms that use external mechanisms, such as ROMMON, although you can run commands to clear the password, if password recovery is disabled in the IPS, the IPS detects that password recovery is not allowed and rejects the external request.
- To check the state of password recovery, use the **show settings | include password** command.

# Time Sources and the Sensor

This section describes how to maintain accurate time on the sensor, and contains the following topics:

- Time Sources and the Sensor, page E-15
- Synchronizing IPS Module Clocks with Parent Device Clocks, page E-16
- Verifying the Sensor is Synchronized with the NTP Server, page E-16
- Correcting Time on the Sensor, page E-17

## Time Sources and the Sensor

**Note** We recommend that you use an NTP server to regulate time on your sensor. You can use authenticated or unauthenticated NTP. For authenticated NTP, you must obtain the NTP server IP address, NTP server key ID, and the key value from the NTP server. You can set up NTP during initialization or you can configure NTP through the CLI, IDM, IME, or ASDM.

The sensor requires a reliable time source. All events (alerts) must have the correct UTC and local time stamp, otherwise, you cannot correctly analyze the logs after an attack. When you initialize the sensor, you set up the time zones and summertime settings. This section provides a summary of the various ways to set the time on sensors.

### The IPS Standalone Appliances

- Use the **clock set** command to set the time. This is the default.
- Configure the appliance to get its time from an NTP time synchronization source.

**Note** The currently supported Cisco IPS appliances are the IPS 4240, IPS 4255, and IPS 4260 [IPS 7.0(x) and later and IPS 7.1(5) and later], IPS 4270-20 [IPS 7.1(3) and later], IPS 4345 and IPS 4360 [IPS 7.1(3) and later], and IPS 4510 and IPS 4520 [IPS 7.1(4) and later].

### The ASA IPS Modules

- The ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP automatically synchronize their clocks with the clock in the adaptive security appliance in which they are installed. This is the default.
- Configure them to get their time from an NTP time synchronization source, such as a Cisco router other than the parent router.

### For More Information

For the procedure for configuring NTP, refer to Configuring NTP.

## Synchronizing IPS Module Clocks with Parent Device Clocks

The ASA IPS modules (ASA 5500 AIP SSM, ASA 5500-X IPS SSP, and ASA 5585-X IPS SSP) synchronize their clocks to the parent chassis clock (switch, router, or adaptive security appliance) each time the IPS boots up and any time the parent chassis clock is set. The IPS clock and parent chassis clock tend to drift apart over time. The difference can be as much as several seconds per day. To avoid this problem, make sure that both the IPS clock and the parent clock are synchronized to an external NTP server. If only the IPS clock or only the parent chassis clock is synchronized to an NTP server, the time drift occurs.

## Verifying the Sensor is Synchronized with the NTP Server

In IPS, you cannot apply an incorrect NTP configuration, such as an invalid NTP key value or ID, to the sensor. If you try to apply an incorrect configuration, you receive an error message. To verify the NTP configuration, use the **show statistics host** command to gather sensor statistics. The NTP statistics section provides NTP statistics including feedback on sensor synchronization with the NTP server.

To verify the NTP configuration, follow these steps:

**Step 1** Log in to the sensor.

**Step 2** Generate the host statistics.

```
sensor# show statistics host
     ...
     NTP Statistics
             remote           refid      st t when poll reach   delay   offset  jitter
         11.22.33.44     CHU_AUDIO(1)     8 u   36   64    1    0.536    0.069   0.001
         LOCAL(0)        73.78.73.84      5 l   35   64    1    0.000    0.000   0.001
        ind assID status  conf reach auth condition  last_event cnt
          1 10372  f014   yes   yes   ok     reject   reachable  1
          2 10373  9014   yes   yes  none    reject   reachable  1
        status = Not Synchronized
     ...
```

**Step 3** Generate the hosts statistics again after a few minutes.

```
  sensor# show statistics host
     ...
     NTP Statistics
             remote           refid      st t when poll reach   delay   offset  jitter
        *11.22.33.44     CHU_AUDIO(1)     8 u   22   64  377    0.518   37.975  33.465
         LOCAL(0)        73.78.73.84      5 l   22   64  377    0.000    0.000   0.001
        ind assID status  conf reach auth condition  last_event cnt
          1 10372  f624   yes   yes   ok   sys.peer   reachable  2
          2 10373  9024   yes   yes  none    reject   reachable  2
```

```
status = Synchronized
```

**Step 4** If the status continues to read `Not Synchronized`, check with the NTP server administrator to make sure the NTP server is configured correctly.

## Correcting Time on the Sensor

If you set the time incorrectly, your stored events will have the incorrect time because they are stamped with the time the event was created. The Event Store time stamp is always based on UTC time. If during the original sensor setup, you set the time incorrectly by specifying 8:00 p.m. rather than 8:00 a.m., when you do correct the error, the corrected time will be set backwards. New events might have times older than old events.

For example, if during the initial setup, you configure the sensor as central time with daylight saving time enabled and the local time is 8:04 p.m., the time is displayed as 20:04:37 CDT and has an offset from UTC of -5 hours (01:04:37 UTC, the next day). A week later at 9:00 a.m., you discover the error: the clock shows 21:00:23 CDT. You then change the time to 9:00 a.m. and now the clock shows 09:01:33 CDT. Because the offset from UTC has not changed, it requires that the UTC time now be 14:01:33 UTC, which creates the time stamp problem.

To ensure the integrity of the time stamp on the event records, you must clear the event archive of the older events by using the **clear events** command.

**Note** You cannot remove individual events.

#### For More Information

For the procedure for clearing events, see Clearing Events, page E-102.

# Advantages and Restrictions of Virtualization

To avoid configuration problems on your sensor, make sure you understand the advantages and restrictions of virtualization on your sensor.

Virtualization has the following advantages:

- You can apply different configurations to different sets of traffic.
- You can monitor two networks with overlapping IP spaces with one sensor.
- You can monitor both inside and outside of a firewall or NAT device.

Virtualization has the following restrictions:

- You must assign both sides of asymmetric traffic to the same virtual sensor.
- Using VACL capture or SPAN (promiscuous monitoring) is inconsistent with regard to VLAN tagging, which causes problems with VLAN groups.
  - When using Cisco IOS software, a VACL capture port or a SPAN target does not always receive tagged packets even if it is configured for trunking.
  - When using the MSFC, fast path switching of learned routes changes the behavior of VACL captures and SPAN.

- Persistent store is limited.

Virtualization has the following traffic capture requirements:

- The virtual sensor must receive traffic that has 802.1q headers (other than traffic on the native VLAN of the capture port).
- The sensor must see both directions of traffic in the same VLAN group in the same virtual sensor for any given sensor.

The following sensors support virtualization:

- ASA 5500 AIP SSM
- ASA 5500-X IPS SSP
- ASA 5585-X IPS SSP
- IPS 4270-20
- IPS 4345
- IPS 4360
- IPS 4510
- IPS 4520

# Supported MIBs

To avoid problems with configuring SNMP, be aware of the MIBs that are supported on the sensor.

The following private MIBs are supported on the sensor:

- CISCO-CIDS-MIB

  The CISCO-CIDS-MIB has been updated to include SNMP health data in IPS 7.1(3)E4 and later.
- CISCO-ENHANCED-MEMPOOL-MIB
- CISCO-ENTITY-ALARM-MIB

You can obtain these private Cisco MIBs under the heading SNMP v2 MIBs at this URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

**Note** MIB II is available on the sensor, but we do not support it. We know that some elements are not correct (for example, the packet counts from the IF MIB on the sensing interfaces). While you can use elements from MIB II, we do not guarantee that they all provide correct information. We fully support the other listed MIBs and their output is correct.

**Note** CISCO-PROCESS-MIB is available on the sensor, but we do not support it. We know that some elements are not available. While you can use elements from CISCO-PROCESS-MIB, we do not guarantee that they all provide correct information. We fully support the other listed MIBs and their output is correct.

# When to Disable Anomaly Detection

If you have anomaly detection enabled and you have your sensor configured to see only one direction of traffic, you should disable anomaly detection. Otherwise, you will receive many alerts, because anomaly detection sees asymmetric traffic as having incomplete connections, that is, like worm scanners, and fires alerts.

To disable anomaly detection, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter analysis engine submode.

```
sensor# configure terminal
sensor(config)# service analysis-engine
sensor(config-ana)#
```

**Step 3** Enter the virtual sensor name that contains the anomaly detection policy you want to disable.

```
sensor(config-ana)# virtual-sensor vs0
sensor(config-ana-vir)#
```

**Step 4** Disable anomaly detection operational mode.

```
sensor(config-ana-vir)# anomaly-detection
sensor(config-ana-vir-ano)# operational-mode inactive
sensor(config-ana-vir-ano)#
```

**Step 5** Exit analysis engine submode.

```
sensor(config-ana-vir-ano)# exit
sensor(config-ana-vir)# exit
sensor(config-ana-)# exit
Apply Changes:?[yes]:
```

**Step 6** Press **Enter** to apply your changes or enter **no** to discard them.

#### For More Information

For more information about Worms, refer to Worms.

# Troubleshooting Global Correlation

Make sure you observe the following when configuring global correlation:

- Because global correlation updates occur through the sensor management interface, firewalls must allow port 443/80 traffic.
- You must have an HTTP proxy server or a DNS server configured to allow global correlation features to function.
- You must have a valid IPS license to allow global correlation features to function.
- Global correlation features only contain external IP addresses, so if you position a sensor in an internal lab, you may never receive global correlation information.
- Make sure your sensor supports the global correlation features.
- Make sure your IPS version supports the global correlation features.

### For More Information

- For detailed information about Global Correlation features and how to configure them, for IDM refer to Configuring Global Correlation, for IME refer to Configuring Global Correlation, and for the CLI refer to Configuring Global Correlation.
- For the procedure for adding a DNS server to support Global Correlation, for IDM refer to Configuring Network Settings, for IME refer to Configuring Network Settings, and for the CLI, refer to Configuring the DNS and Proxy Servers for Global Correlation.
- For the procedure for obtaining and installing the IPS license key, for IDM refer to Configuring Licensing, for IME refer to Configuring Licensing, and for the CLI, refer to Installing the License Key.

# Analysis Engine Not Responding

**Error Message** `Output from show statistics analysis-engine`
`Error: getAnalysisEngineStatistics : ct-sensorApp.424 not responding, please check system processes - The connect to the specified Io::ClientPipe failed.`

**Error Message** `Output from show statistics anomaly-detection`
`Error: getAnomalyDetectionStatistics : ct-sensorApp.424 not responding, please check system processes - The connect to the specified Io::ClientPipe failed.`

**Error Message** `Output from show statistics denied-attackers`
`Error: getDeniedAttackersStatistics : ct-sensorApp.424 not responding, please check system processes - The connect to the specified Io::ClientPipe failed.`

**Possible Cause** These error messages appear when you run the **show tech support** command and the Analysis Engine is not running.

**Recommended Action** Verify the Analysis Engine is running and monitor it to see if the issue is resolved.

To verify the Analysis Engine is running and to monitor the issue, follow these steps:

**Step 1** Log in to the sensor.

**Step 2** Verify that the Analysis Engine is not running, Check to see if the Analysis Engine reads `Not Running`.

```
sensor# show version

-----
MainApp N-2007_JUN_19_16_45 (Release) 2007-06-19T17:10:20-0500 Running
AnalysisEngine N-2007_JUN_19_16_45 (Release) 2007-06-19T17:10:20-0500 Not Running
CLI N-2007_JUN_19_16_45 (Release) 2007-06-19T17:10:20-0500
```

**Step 3** Enter **show tech-support** and save the output.

**Step 4** Reboot the sensor.

**Step 5** Enter **show version** after the sensor has stabilized to see if the issue is resolved.

**Step 6** If the Analysis Engine still reads `Not Running`, contact TAC with the original **show tech support** command output.

# Troubleshooting RADIUS Authentication

**Symptom** Attempt limit configured on the IPS sensor may not be enforced for a RADIUS user.

**Conditions** Applicable for RADIUS users only. The RADIUS user must have logged in to the sensor at least once after RADIUS authentication is enabled or after the sensor is reset or rebooted.

**Workaround** Log in to the sensor with the correct credentials and from that time on the attempt limit is enforced for that RADIUS user.

**For More Information**

For detailed information on RADIUS authentication, refer to Configuring Authentication and User Parameters.

# Troubleshooting External Product Interfaces

This section lists issues that can occur with external product interfaces and provides troubleshooting tips. For more information on external product interfaces, refer to Configuring External Product Interfaces. This section contains the following topics:


- External Product Interfaces Issues, page E-21
- External Product Interfaces Troubleshooting Tips, page E-22


## External Product Interfaces Issues

When the external product interface receives host posture and quarantine events, the following issues can arise:

- The sensor can store only a certain number of host records:
  - If the number of records exceeds 10,000, subsequent records are dropped.
  - If the 10,000 limit is reached and then it drops to below 9900, new records are no longer dropped.
- Hosts can change an IP address or appear to use another host IP address, for example, because of DHCP lease expiration or movement in a wireless network. In the case of an IP address conflict, the sensor presumes the most recent host posture event to be the most accurate.
- A network can include overlapping IP address ranges in different VLANs, but host postures do not include VLAN ID information. You can configure the sensor to ignore specified address ranges.
- A host can be unreachable from the CSA MC because it is behind a firewall. You can exclude unreachable hosts.

- The CSA MC event server allows up to ten open subscriptions by default. You can change this value. You must have an administrative account and password to open subscriptions.
- CSA data is not virtualized; it is treated globally by the sensor.
- Host posture OS and IP addresses are integrated into passive OS fingerprinting storage. You can view them as imported OS profiles.
- You cannot see the quarantined hosts.
- The sensor must recognize each CSA MC host X.509 certificate. You must add them as a trusted host.
- You can configure a maximum of two external product devices.

#### For More Information

- For more information on working with OS maps and identifications, refer to Adding, Editing, Deleting, and Moving Configured OS Maps and Adding, Editing, Deleting, and Moving Configured OS Maps.
- For the procedure for adding trusted hosts, refer to Adding TLS Trusted Hosts.

## External Product Interfaces Troubleshooting Tips

To troubleshoot external product interfaces, check the following:

- Make sure the interface is active by checking the output from the **show statistics external-product-interface** command in the CLI, or choose **Monitoring > Sensor Monitoring > Support Information > Statistics** in the IDM and check the Interface state line in the response, or choose **Configuration > *sensor_name* > Sensor Monitoring > Support Information > Statistics** in the IME, and check the Interface state line in the response.
- Make sure you have added the CSA MC IP address to the trusted hosts. If you forgot to add it, add it, wait a few minutes and then check again.
- Confirm subscription login information by opening and closing a subscription on the CSA MC using the browser.
- Check the Event Store for the CSA MC subscription errors.

#### For More Information

- For the procedure for adding trusted hosts, refer to Adding TLS Trusted Hosts.
- For the procedure for displaying events, refer to Displaying Events.

# Troubleshooting the Appliance

This section contains information to troubleshoot the appliance. It contains the following topics:

- The Appliance and Jumbo Packet Frame Size, page E-23
- Hardware Bypass and Link Changes and Drops, page E-23
- Troubleshooting Loose Connections, page E-24
- Analysis Engine is Busy, page E-24
- Communication Problems, page E-25

- Communication Problems, page E-25
- The SensorApp and Alerting, page E-29
- Blocking, page E-36
- Logging, page E-45
- TCP Reset Not Occurring for a Signature, page E-51
- Software Upgrades, page E-52


**Tip** Before troubleshooting the appliance, check the Caveats section of the Readme for the software version you have installed on your sensor to see if you are dealing with a known issue.

# The Appliance and Jumbo Packet Frame Size

For IPS standalone appliances with 1 G and 10 G fixed or add-on interfaces, the maximum jumbo frame size is 9216 bytes.

**Note** A jumbo frame is an Ethernet packet that is larger than the standard maximum of 1518 bytes (including Layer 2 header and FCS).

# Hardware Bypass and Link Changes and Drops

**Note** Hardware bypass is available on the 4GE bypass interface card, which is supported on the IPS 4270-20.

Properly configuring and deploying hardware bypass protects against complete link failure if the IPS appliance experiences a power loss, critical hardware failure, or is rebooted; however, a link status change still occurs when hardware bypass engages (and again when it disengages).

During engagement, the interface card disconnects both physical connections from itself and bridges them together. The interfaces of the connected devices can then negotiate the link and traffic forwarding can resume. Once the appliance is back online, hardware bypass disengages and the interface card interrupts the bypass and reconnects the links back to itself. The interface card then negotiates both links and traffic resumes.

There is no built-in way to completely avoid link status changes and drops. However, you can greatly reduce the interruption time (in some cases to sub-second times) by doing the following:

- Make sure you use CAT 5e/6-certified cabling for all connections.
- Make sure the interfaces of the connected devices are configured to match the interfaces of the appliance for speed/duplex negotiation (auto/auto).
- Enable portfast on connected switchports to reduce spanning-tree forwarding delays.

### For More Information

For more information about the hardware bypass card on the IPS 4270-20, see Hardware Bypass, page 3-5.

# Troubleshooting Loose Connections

Perform the following actions to troubleshoot loose connections on sensors:

- Make sure all power cords are securely connected.
- Make sure all cables are properly aligned and securely connected for all external and internal components.
- Remove and check all data and power cables for damage. Make sure no cables have bent pins or damaged connectors.
- Make sure each device is properly seated.
- If a device has latches, make sure they are completely closed and locked.
- Check any interlock or interconnect indicators that indicate a component is not connected properly.
- If problems continue, remove and reinstall each device, checking the connectors and sockets for bent pins or other damage.

# Analysis Engine is Busy

After you reimage a sensor, the Analysis Engine is busy rebuilding Regex tables and does not respond to new configurations. You can check whether the Analysis Engine is busy by using the **show statistics virtual-sensor** command. You receive the following error message if the Analysis Engine is busy:

```
sensor# show statistics virtual-sensor
Error: getVirtualSensorStatistics : Analysis Engine is busy rebuilding regex tables. This
may take a while.
sensor#
```

When the Analysis Engine is busy rebuilding Regex tables, you receive an error message if you try to update a configuration, for example, enabling or retiring a signature:

```
sensor# configure terminal
sensor(config)# service sig sig0
sensor(config-sig)# sig 2000 0
sensor(config-sig-sig)# status enabled
sensor(config-sig-sig)# status
sensor(config-sig-sig-sta)# enabled true
sensor(config-sig-sig-sta)# retired false
sensor(config-sig-sig-sta)# exit
sensor(config-sig-sig)# exit
sensor(config-sig)# exit
Apply Changes?[yes]:
Error: editConfigDeltaSignatureDefinition : Analysis Engine is busy rebuilding regex
tables. This may take a while.
The configuration changes failed validation, no changes were applied.
Would you like to return to edit mode to correct the errors? [yes]: no
No changes were made to the configuration.
sensor(config)#
```

If you try to get the virtual sensor statistics immediately after you boot a sensor, you receive an error message. Although the sensor has rebuilt the cache files, the virtual sensor is not finished initializing.

```
sensor# show statistics virtual-sensor
Error: getVirtualSensorStatistics : Analysis Engine is busy.
sensor#
```

When you receive the errors that the Analysis Engine is busy, wait a while before trying to make configuration changes. Use the **show statistics virtual-sensor** command to find out when the Analysis Engine is available again.

# Communication Problems

This section helps you troubleshoot communication problems with the sensor. It contains the following topics:


- Cannot Access the Sensor CLI Through Telnet or SSH, page E-25
- Correcting a Misconfigured Access List, page E-27
- Duplicate IP Address Shuts Interface Down, page E-28


## Cannot Access the Sensor CLI Through Telnet or SSH

If you cannot access the sensor CLI through Telnet (if you already have it enabled) or SSH, follow these steps:

**Step 1** Log in to the sensor CLI through a console, terminal, or module session.

**Step 2** Make sure that the sensor management interface is enabled. The management interface is the interface in the list with the status line `Media Type = TX`. If the Link Status is `Down`, go to Step 3. If the Link Status is `Up`, go to Step 5.

```
sensor# show interfaces
Interface Statistics
   Total Packets Received = 0
   Total Bytes Received = 0
   Missed Packet Percentage = 0
   Current Bypass Mode = Auto_off
MAC statistics from interface GigabitEthernet0/1
   Media Type = backplane
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Up
   Link Speed = Auto_1000
   Link Duplex = Auto_Full
   Total Packets Received = 0
   Total Bytes Received = 0
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 0
   Total Bytes Transmitted = 0
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
MAC statistics from interface GigabitEthernet0/0
   Media Type = TX
   Link Status = Up
```

```
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 944333
   Total Bytes Received = 83118358
   Total Multicast Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 397633
   Total Bytes Transmitted = 435730956
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
sensor#
```

**Step 3** Make sure the sensor IP address is unique. If the management interface detects that another device on the network has the same IP address, it does not come up.

```
sensor# setup
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
User ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.


Current Configuration:


service host
network-settings
host-ip 192.168.1.2/24,192.168.1.1
host-name sensor
telnet-option enabled
access-list 0.0.0.0/0
ftp-timeout 300
no login-banner-text
exit
--MORE--
```

**Step 4** Make sure the management port is connected to an active network connection. If the management port is not connected to an active network connection, the management interface does not come up.

**Step 5** Make sure the IP address of the workstation that is trying to connect to the sensor is permitted in the sensor access list. If the workstation network address is permitted in the sensor access list, go to Step 6.

```
sensor# setup
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
User ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.


Current Configuration:


service host
network-settings
host-ip 192.168.1.2/24,192.168.1.1
host-name sensor
telnet-option enabled
access-list 0.0.0.0/0
ftp-timeout 300
no login-banner-text
exit
```

```
--MORE--
```

**Step 6** Add a permit entry for the workstation network address, save the configuration, and try to connect again.

**Step 7** Make sure the network configuration allows the workstation to connect to the sensor. If the sensor is protected behind a firewall and the workstation is in front of the firewall, make sure the firewall is configured to allow the workstation to access the sensor. Or if the workstation is behind a firewall that is performing network address translation on the workstation IP address, and the sensor is in front of the firewall, make sure that the sensor access list contains a permit entry for the workstation translated address.

### For More Information

- For the procedures for changing the IP address, changing the access list, and enabling and disabling Telnet, refer to Configuring Network Settings.
- For the various ways to open a CLI session directly on the sensor, see Appendix A, "Logging In to the Sensor."

## Correcting a Misconfigured Access List

To correct a misconfigured access list, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** View your configuration to see the access list.

```
sensor# show configuration | include access-list
access-list 10.0.0.0/8
access-list 64.0.0.0/8
sensor#
```

**Step 3** Verify that the client IP address is listed in the allowed networks. If it is not, add it.

```
sensor# configure terminal
sensor(config)# service host
sensor(config-hos)# network-settings
sensor(config-hos-net)# access-list 171.69.70.0/24
```

**Step 4** Verify the settings.

```
sensor(config-hos-net)# show settings
   network-settings
   -----------------------------------------------
      host-ip: 192.168.1.2/24,192.168.1.1 default: 10.1.9.201/24,10.1.9.1
      host-name: sensor-238 default: sensor
      telnet-option: enabled default: disabled
      access-list (min: 0, max: 512, current: 3)
      -----------------------------------------------
         network-address: 10.0.0.0/8
         -------------------------------------------
         network-address: 64.0.0.0/8
         -------------------------------------------
         network-address: 171.69.70.0/24
         -------------------------------------------
      -----------------------------------------------
```

```
      ftp-timeout: 300 seconds <defaulted>
      login-banner-text: <defaulted>
   ------------------------------------------------
sensor(config-hos-net)#
```

## Duplicate IP Address Shuts Interface Down

If you have two newly imaged sensors with the same IP address that come up on the same network at the same time, the interface shuts down. Linux prevents the command and control interface from activating if it detects an address conflict with another host.

To verify that the sensor in question does not have an IP address conflict with another host on the network, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Determine whether the interface is up. If the output says the command and control interface link status is down, there is a hardware issue or an IP address conflict.

```
sensor# show interfaces
Interface Statistics
   Total Packets Received = 0
   Total Bytes Received = 0
   Missed Packet Percentage = 0
   Current Bypass Mode = Auto_off
MAC statistics from interface GigabitEthernet0/1
   Media Type = backplane
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Up
   Link Speed = Auto_1000
   Link Duplex = Auto_Full
   Total Packets Received = 0
   Total Bytes Received = 0
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 0
   Total Bytes Transmitted = 0
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
MAC statistics from interface GigabitEthernet0/0
   Media Type = TX
   Link Status = Up
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 1822323
   Total Bytes Received = 131098876
   Total Multicast Packets Received = 20
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
```

```
   Total Packets Transmitted = 219260
   Total Bytes Transmitted = 103668610
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
sensor#
```

**Step 3** Make sure the sensor cabling is correct.

**Step 4** Make sure the IP address is correct.

---

**For More Information**

- To make sure the sensor cabling is correct, refer to the chapter for your sensor in this document.
- For the procedure for making sure the IP address is correct, refer to Configuring Network Settings.

# The SensorApp and Alerting

This section helps you troubleshoot issues with the SensorApp and alerting. It contains the following topics:


- The SensorApp Is Not Running, page E-29
- Physical Connectivity, SPAN, or VACL Port Issue, page E-31
- Unable to See Alerts, page E-32
- Sensor Not Seeing Packets, page E-34
- Cleaning Up a Corrupted SensorApp Configuration, page E-35


## The SensorApp Is Not Running

The sensing process, SensorApp, should always be running. If it is not, you do not receive any alerts. The SensorApp is part of the Analysis Engine, so you must make sure the Analysis Engine is running.

To make sure the Analysis Engine is running, follow these steps:

---

**Step 1** Log in to the CLI.

**Step 2** Determine the status of the Analysis Engine service and whether you have the latest software updates.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
Serial Number:          123456789AB
No license present
Sensor up-time is 13 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.7M out of 171.6M bytes of available disk space (43%
 usage)
```

```
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96%
 usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CollaborationApp   S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CLI                S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600

Upgrade History:

  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4

Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013
sensor#
```

**Step 3** If the Analysis Engine is not running, look for any errors connected to it.

```
sensor# show events error fatal past 13:00:00 | include AnalysisEngine
evError: eventId=1077219258696330005 severity=warning

originator:
hostId: sensor
appName: sensorApp
appInstanceId: 1045
time: 2004/02/19 19:34:20 2004/02/19 19:34:20 UTC
errorMessage: name=errUnclassified Generating new Analysis Engine configuration file.
```

**Note** The date and time of the last restart is listed. In this example, the last restart was on 2-19-2004 at 7:34.

**Step 4** If you do not have the latest software updates, download them from Cisco.com. Read the Readme that accompanies the software upgrade for any known DDTS for the SensorApp or the Analysis Engine.

**Step 5** If the Analysis Engine is still not running, enter **show tech-support** and save the output.

**Step 6** Reboot the sensor.

**Step 7** Enter **show version** after the sensor has stabilized to see if the issue is resolved.

**Step 8** If the Analysis Engine still reads `Not Running`, contact TAC with the original **show tech support** command output.

### For More Information

- For more information on IPS system architecture, refer to System Architecture.
- For the procedure for obtaining the latest Cisco IPS software, see Obtaining Cisco IPS Software, page C-1.

## Physical Connectivity, SPAN, or VACL Port Issue

If the sensor is not connected properly, you do not receive any alerts.

To make sure the sensor is connected properly, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Make sure the interfaces are up and that the packet count is increasing.

```
sensor# show interfaces
Interface Statistics
   Total Packets Received = 0
   Total Bytes Received = 0
   Missed Packet Percentage = 0
   Current Bypass Mode = Auto_off
MAC statistics from interface GigabitEthernet0/1
   Media Type = backplane
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Up
   Link Speed = Auto_1000
   Link Duplex = Auto_Full
   Total Packets Received = 0
   Total Bytes Received = 0
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 0
   Total Bytes Transmitted = 0
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
MAC statistics from interface GigabitEthernet0/0
   Media Type = TX
   Link Status = Up
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 1830137
   Total Bytes Received = 131624465
   Total Multicast Packets Received = 20
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 220052
   Total Bytes Transmitted = 103796666
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
sensor#
```

**Step 3** If the Link Status is down, make sure the sensing port is connected properly.

**Step 4** Verify the interface configuration:

- Make sure you have the interfaces configured properly.
- Verify the SPAN and VACL capture port configuration on the Cisco switch.

  Refer to your switch documentation for the procedure.

**Step 5** Verify again that the interfaces are up and that the packet count is increasing.

```
sensor# show interfaces
```

---

**For More Information**

- For the procedure for properly installing the sensing interface on your sensor, refer to the chapter on your appliance in this document.
- For the procedures for configuring interfaces on your sensor, refer to Configuring Interfaces.

## Unable to See Alerts

If you are not seeing alerts, try the following:

- Make sure the signature is enabled
- Make sure the signature is not retired
- Make sure that you have Produce Alert configured as an action

**Note** If you choose Produce Alert, but come back later and add another event action and do not add Produce Alert to the new configuration, alerts are not sent to the Event Store. Every time you configure a signature, the new configuration overwrites the old one, so make sure you have configured all the event actions you want for each signature.

- Make sure the sensor is seeing packets
- Make sure that alerts are being generated
- Make sure the sensing interface is in a virtual sensor

To make sure you can see alerts, follow these steps:

---

**Step 1** Log in to the CLI.

**Step 2** Make sure the signature is enabled.

```
sensor# configure terminal
sensor(config)# service signature-definition sig0
sensor(config-sig)# signatures 1300 0
sensor(config-sig-sig)# status
sensor(config-sig-sig-sta)# show settings
   status
   -----------------------------------------------
      enabled: true <defaulted>
      retired: false <defaulted>
   -----------------------------------------------
sensor(config-sig-sig-sta)#
```

**Step 3** Make sure you have Produce Alert configured.

```
sensor# configure terminal
```

```
sensor(config)# service signature-definition sig0
sensor(config-sig)# signatures 1300 0
sensor(config-sig-sig)# engine ?
normalizer     Signature engine
sensor(config-sig-sig)# engine normalizer
sensor(config-sig-sig-nor)# event-action produce-alert
sensor(config-sig-sig-nor)# show settings
   normalizer
   -----------------------------------------------
      event-action: produce-alert default: produce-alert|deny-connection-inline
      edit-default-sigs-only
      -----------------------------------------------
sensor#
```

**Step 4** Make sure the sensor is seeing packets.

```
sensor# show interfaces FastEthernet0/1
MAC statistics from interface FastEthernet0/1
   Media Type = backplane
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Up
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 267581
   Total Bytes Received = 24886471
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 57301
   Total Bytes Transmitted = 3441000
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 1
   Total Transmit FIFO Overruns = 0
sensor#
```

**Step 5** Check for alerts.

```
sensor# show statistics virtual-sensor
SigEvent Preliminary Stage Statistics
    Number of Alerts received = 0
    Number of Alerts Consumed by AlertInterval = 0
    Number of Alerts Consumed by Event Count = 0
    Number of FireOnce First Alerts = 0
    Number of FireOnce Intermediate Alerts = 0
    Number of Summary First Alerts  = 0
    Number of Summary Intermediate Alerts  = 0
    Number of Regular Summary Final Alerts  = 0
    Number of Global Summary Final Alerts  = 0
    Number of Alerts Output for further processing = 0alertDetails: Traffic Source: int0 ;
```

## Sensor Not Seeing Packets

If the sensor is not seeing any packets on the network, you could have the interfaces set up incorrectly.

If the sensor is not seeing packets, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Make sure the interfaces are up and receiving packets.

```
sensor# show interfaces GigabitEthernet0/1
MAC statistics from interface GigabitEthernet0/1
   Media Type = backplane
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Down
   Link Speed = Auto_1000
   Link Duplex = Auto_Full
   Total Packets Received = 0
   Total Bytes Received = 0
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 0
   Total Bytes Transmitted = 0
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
sensor#
```

**Step 3** If the interfaces are not up, do the following:

- Check the cabling.
- Enable the interface.

```
sensor# configure terminal
sensor(config)# service interface
sensor(config-int)# physical-interfaces GigabitEthernet0/1
sensor(config-int-phy)# admin-state enabled
sensor(config-int-phy)# show settings
   <protected entry>
   name: GigabitEthernet0/1
   -----------------------------------------------
      media-type: tx <protected>
      description: <defaulted>
      admin-state: enabled default: disabled
      duplex: auto <defaulted>
      speed: auto <defaulted>
      alt-tcp-reset-interface
      -------------------------------------------------
         none
         -------------------------------------------------
         -------------------------------------------------
      -------------------------------------------------
   -----------------------------------------------
sensor(config-int-phy)#
```

**Step 4** Check to see that the interface is up and receiving packets.

```
sensor# show interfaces
MAC statistics from interface GigabitEthernet0/1
   Media Type = TX
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Up
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 3
   Total Bytes Received = 900
   Total Multicast Packets Received = 3
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 0
   Total Bytes Transmitted = 0
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0 ...
```

#### For More Information

For the procedure for installing the sensor properly, refer to your sensor chapter in this document.

## Cleaning Up a Corrupted SensorApp Configuration

If the SensorApp configuration has become corrupted and the SensorApp cannot run, you must delete it entirely and restart the SensorApp.

To delete the SensorApp configuration, follow these steps:

**Step 1** Log in to the service account.

**Step 2** Su to root.

**Step 3** Stop the IPS applications.

```
/etc/init.d/cids stop
```

**Step 4** Replace the virtual sensor file.

```
cp /usr/cids/idsRoot/etc/defVirtualSensorConfig.xml
/usr/cids/idsRoot/etc/VS-Config/virtualSensor.xml
```

**Step 5** Remove the cache files.

```
rm /usr/cids/idsRoot/var/virtualSensor/*.pmz
```

**Step 6** Exit the service account.

**Step 7** Log in to the sensor CLI.

**Step 8** Start the IPS services.

```
sensor# cids start
```

**Step 9** Log in to an account with administrator privileges.

**Step 10** Reboot the sensor.

```
sensor# reset
Warning: Executing this command will stop all applications and reboot the node.
Continue with reset? [yes]:yes
Request Succeeded.
sensor#
```

---

#### For More Information

For more information on IPS system architecture, refer to System Architecture.

# Blocking

This section provides troubleshooting help for blocking and the ARC service. It contains the following topics.


- Troubleshooting Blocking, page E-36
- Verifying ARC is Running, page E-37
- Verifying ARC Connections are Active, page E-38
- Device Access Issues, page E-40
- Verifying the Interfaces and Directions on the Network Device, page E-41
- Enabling SSH Connections to the Network Device, page E-42
- Blocking Not Occurring for a Signature, page E-42
- Verifying the Master Blocking Sensor Configuration, page E-43


## Troubleshooting Blocking

After you have configured the ARC, you can verify if it is running properly by using the **show version** command. To verify that the ARC is connecting to the network devices, use the **show statistics network-access** command.

**Note** The ARC was formerly known as Network Access Controller. Although the name has been changed since IPS 5.1, it still appears in IDM, IME, and the CLI as Network Access Controller, **nac**, and **network-access**.

To troubleshoot the ARC, follow these steps:

1. Verify that the ARC is running.
2. Verify that the ARC is connecting to the network devices.
3. Verify that the Event Action is set to Block Host for specific signatures.
4. Verify that the master blocking sensor is properly configured.

### For More Information

- For the procedure to verify that ARC is running, see Verifying ARC is Running, page E-37.
- For the procedure to verify that ARC is connecting, see Verifying ARC Connections are Active, page E-38.
- For the procedure to verify that the Event Action is set to Block Host, see Blocking Not Occurring for a Signature, page E-42.
- For the procedure to verify that the master blocking sensor is properly configured, see Verifying the Master Blocking Sensor Configuration, page E-43.
- For a discussion of ARC architecture, refer to Attack Response Controller.

## Verifying ARC is Running

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

To verify that the ARC is running, use the **show version** command. If the MainApp is not running, the ARC cannot run. The ARC is part of the MainApp.

To verify that the ARC is running, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Verify that the MainApp is running.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
Serial Number:          123456789AB
No license present
Sensor up-time is 13 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.7M out of 171.6M bytes of available disk space (43%
 usage)
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96%
 usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600    Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600    Running
CollaborationApp   S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600    Running
CLI                S-2011_NOV_16_00_20_7_1_3_46    (Release)    2011-11-16T00:23:0
6-0600
```

```
Upgrade History:

  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4

Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013

sensor#
```

**Step 3** If the MainApp displays `Not Running`, the ARC has failed. Contact TAC.

### For More Information

For more information on IPS system architecture, refer to System Architecture.

## Verifying ARC Connections are Active

If the State is not `Active` in the ARC statistics, there is a problem.

To verify that the State is Active in the statistics, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Verify that the ARC is connecting. Check the State section of the output to verify that all devices are connecting.

```
sensor# show statistics network-access
Current Configuration
   LogAllBlockEventsAndSensors = true
   EnableNvramWrite = false
   EnableAclLogging = false
   AllowSensorBlock = false
   BlockMaxEntries = 250
   MaxDeviceInterfaces = 250
   NetDevice
      Type = Cisco
      IP = 10.89.147.54
      NATAddr = 0.0.0.0
      Communications = telnet
      BlockInterface
         InterfaceName = fa0/0
         InterfaceDirection = in
State
   BlockEnable = true
   NetDevice
      IP = 10.89.147.54
      AclSupport = uses Named ACLs
      Version = 12.2
      State = Active
sensor#
```

**Step 3** If the ARC is not connecting, look for recurring errors.

```
sensor# show events error hh:mm:ss month day year | include : nac
```

Example

```
sensor# show events error 00:00:00 Apr 01 2011 | include : nac
```

**Step 4** Make sure you have the latest software updates.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
Serial Number:          123456789AB
No license present
Sensor up-time is 13 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.7M out of 171.6M bytes of available disk space (43%
 usage)
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96%
 usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CollaborationApp   S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CLI                S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600

Upgrade History:

  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4

Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013

sensor#
```

**Note** If you do not have the latest software updates, download them from Cisco.com. Read the Readme that accompanies the software upgrade for any known DDTS for the ARC.

**Step 5** Make sure the configuration settings for each device are correct (the username, password, and IP address).

**Step 6** Make sure the interface and directions for each network device are correct.

**Step 7** If the network device is using SSH-3DES, make sure that you have enabled SSH connections to the device.

**Step 8** Verify that each interface and direction on each controlled device is correct.

### For More Information

- For the procedure for obtaining the latest Cisco IPS software, see Obtaining Cisco IPS Software, page C-1.
- For more information about configuring devices, see Device Access Issues, page E-40.
- For the procedure for verifying the interfaces and directions for each network device, see Verifying the Interfaces and Directions on the Network Device, page E-41.
- For the procedure for enabling SSH, see Enabling SSH Connections to the Network Device, page E-42.

## Device Access Issues

The ARC may not be able to access the devices it is managing. Make sure the you have the correct IP address and username and password for the managed devices and the correct interface and direction configured.

**Note** SSH devices must support SSH 1.5. The sensor does not support SSH 2.0.

To troubleshoot device access issues, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Verify the IP address for the managed devices.

```
sensor# configure terminal
sensor (config)# service network-access
sensor(config-net)# show settings
   general
   ------------------------------------------------
      log-all-block-events-and-errors: true <defaulted>
      enable-nvram-write: false <defaulted>
      enable-acl-logging: false <defaulted>
      allow-sensor-block: false <defaulted>
      block-enable: true <defaulted>
      block-max-entries: 250 <defaulted>
      max-interfaces: 250 <defaulted>
      master-blocking-sensors (min: 0, max: 100, current: 0)
      ------------------------------------------------
      ------------------------------------------------
      never-block-hosts (min: 0, max: 250, current: 0)
      ------------------------------------------------
      ------------------------------------------------
      never-block-networks (min: 0, max: 250, current: 0)
      ------------------------------------------------
      ------------------------------------------------
      block-hosts (min: 0, max: 250, current: 0)
      ------------------------------------------------
      ------------------------------------------------
      block-networks (min: 0, max: 250, current: 0)
      ------------------------------------------------
      ------------------------------------------------
   ------------------------------------------------
   user-profiles (min: 0, max: 250, current: 1)
   ------------------------------------------------
      profile-name: r7200
      ------------------------------------------------
         enable-password: <hidden>
```

```
            password: <hidden>
            username: netrangr default:
         ---------------------------------------------
      ---------------------------------------------
      cat6k-devices (min: 0, max: 250, current: 0)
      ---------------------------------------------
      ---------------------------------------------
      router-devices (min: 0, max: 250, current: 1)
      ---------------------------------------------
         ip-address: 10.89.147.54
         ---------------------------------------------
            communication: telnet default: ssh-3des
            nat-address: 0.0.0.0 <defaulted>
            profile-name: r7200
            block-interfaces (min: 0, max: 100, current: 1)
            ---------------------------------------------
               interface-name: fa0/0
               direction: in
               -----------------------------------------------
                  pre-acl-name: <defaulted>
                  post-acl-name: <defaulted>
               -----------------------------------------------
            ---------------------------------------------
         ---------------------------------------------
      ---------------------------------------------
      firewall-devices (min: 0, max: 250, current: 0)
      ---------------------------------------------
      ---------------------------------------------
sensor(config-net)#
```

**Step 3** Manually connect to the device to make sure you have used the correct username, password, and enable password, and to ensure that the device is reachable from the sensor:

**a.** Log in to the service account.

**b.** Telnet or SSH to the network device to verify the configuration.

**c.** Make sure you can reach the device.

**d.** Verify the username and password.

**Step 4** Verify that each interface and direction on each network device is correct.

#### For More Information

For the procedure for verifying the interfaces and directions for each network device, see Verifying the Interfaces and Directions on the Network Device, page E-41.

## Verifying the Interfaces and Directions on the Network Device

To verify that each interface and direction on each controlled device is correct, you can send a manual block to a bogus host and then check to see if deny entries exist for the blocked addresses in the ACL of the router.

To perform a manual block using IDM, choose **Monitoring > Sensor Monitoring > Time-Based Actions > Host Blocks**. To perform a manual block using IME, choose **Configuration > *sensor_name* > Sensor Monitoring > Time-Based Actions > Host Blocks**.

To initiate a manual block to a bogus host, follow these steps:

**Step 1** Enter ARC general submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)# general
```

**Step 2** Start the manual block of the bogus host IP address.

```
sensor(config-net-gen)# block-hosts 10.16.0.0
```

**Step 3** Exit general submode.

```
sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:? [yes]:
```

**Step 4** Press **Enter** to apply the changes or type **no** to discard them.

**Step 5** Telnet to the router and verify that a deny entry for the blocked address exists in the router ACL. Refer to the router documentation for the procedure.

**Step 6** Remove the manual block by repeating Steps 1 through 4 except in Step 2 place **no** in front of the command.

```
sensor(config-net-gen)# no block-hosts 10.16.0.0
```

#### Enabling SSH Connections to the Network Device

If you are using SSH-3DES as the communication protocol for the network device, you must make sure you have enabled it on the device.

To enable SSH-3DES connections to the network device, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Enter configuration mode.

```
sensor# configure terminal
```

**Step 3** Enable SSH-3DES.

```
sensor(config)# ssh-3des host blocking_device_ip_address
```

**Step 4** Type **yes** when prompted to accept the device.

## Blocking Not Occurring for a Signature

If blocking is not occurring for a specific signature, check that the event action is set to block the host.

To make sure blocking is occurring for a specific signature, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Enter signature definition submode.

```
sensor# configure terminal
```

```
sensor(config)# service signature-definition sig0
sensor(config-sig)#
```

**Step 3** Make sure the event action is set to block the host.

**Note** If you want to receive alerts, you must always add **produce-alert** any time you configure the event actions.

```
sensor(config-sig)# signatures 1300 0
sensor(config-sig-sig)# engine normalizer
sensor(config-sig-sig-nor)# event-action produce-alert|request-block-host
sensor(config-sig-sig-nor)# show settings
   normalizer
   -----------------------------------------------
      event-action: produce-alert|request-block-host default: produce-alert|deny
-connection-inline
      edit-default-sigs-only
      -------------------------------------------
         default-signatures-only
         ----------------------------------------
            specify-service-ports
            ---------------------------------------
               no
               ---------------------------------------
               ---------------------------------------
            ---------------------------------------
            specify-tcp-max-mss
            ---------------------------------------
               no
               ---------------------------------------
               ---------------------------------------
            ---------------------------------------
            specify-tcp-min-mss
            ---------------------------------------
               no
               ---------------------------------------
               ---------------------------------------
--MORE--
```

**Step 4** Exit signature definition submode.

```
sensor(config-sig-sig-nor)# exit
sensor(config-sig-sig)# exit
sensor(config-sig)# exit
Apply Changes:?[yes]:
```

**Step 5** Press **Enter** to apply the changes or type **no** to discard them.

## Verifying the Master Blocking Sensor Configuration

To verify that a master blocking sensor is set up properly or to troubleshoot a master blocking sensor that is not set up properly, you can use the **show statistics network-access** command. Make sure that the forwarding sensor is set up as TLS trusted host if the remote master blocking sensor is using TLS for web access.

To verify a master blocking sensor configuration, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** View the ARC statistics and verify that the master blocking sensor entries are in the statistics.

```
sensor# show statistics network-access
Current Configuration
   AllowSensorShun = false
   ShunMaxEntries = 250
   MasterBlockingSensor
      SensorIp = 10.89.149.46
      SensorPort = 443
      UseTls = 1
State
   ShunEnable = true
   ShunnedAddr
      Host
         IP = 122.122.122.44
         ShunMinutes = 60
         MinutesRemaining = 59
```

**Step 3** If the master blocking sensor does not show up in the statistics, you need to add it.

**Step 4** Initiate a manual block to a bogus host IP address to make sure the master blocking sensor is initiating blocks.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)# general
sensor(config-net-gen)# block-hosts 10.16.0.0
```

**Step 5** Exit network access general submode.

```
sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:? [yes]:
```

**Step 6** Press **Enter** to apply the changes or type **no** to discard them.

**Step 7** Verify that the block shows up in the ARC statistics.

```
sensor# show statistics network-access
Current Configuration
   AllowSensorShun = false
   ShunMaxEntries = 100
State
   ShunEnable = true
   ShunnedAddr
      Host
         IP = 10.16.0.0
         ShunMinutes =
```

**Step 8** Log in to the CLI of the master blocking sensor host, and using the **show statistics network-access** command, verify that the block also shows up in the master blocking sensor ARC statistics.

```
sensor# show statistics network-access
Current Configuration
   AllowSensorShun = false
   ShunMaxEntries = 250
   MasterBlockingSensor
      SensorIp = 10.89.149.46
      SensorPort = 443
      UseTls = 1
State
```

```
ShunEnable = true
ShunnedAddr
   Host
      IP = 10.16.0.0
      ShunMinutes = 60
      MinutesRemaining = 59
```

**Step 9** If the remote master blocking sensor is using TLS for web access, make sure the forwarding sensor is configured as a TLS host.

```
sensor# configure terminal
sensor(config)# tls trust ip master_blocking_sensor_ip_address
```

#### For More Information

For the procedure to configure the sensor to be a master blocking sensor, refer to Configuring the Sensor to be a Master Blocking Sensor.

# Logging

TAC may suggest that you turn on debug logging for troubleshooting purposes. Logger controls what log messages are generated by each application by controlling the logging severity for different logging zones. By default, debug logging is not turned on. If you enable individual zone control, each zone uses the level of logging that it is configured for. Otherwise, the same logging level is used for all zones. This section contains the following topics:


- Enabling Debug Logging, page E-45
- Zone Names, page E-49
- Directing cidLog Messages to SysLog, page E-50


## Enabling Debug Logging

**Caution** Enabling debug logging seriously affects performance and should only be done when instructed by TAC.

To enable debug logging, follow these steps:

**Step 1** Log in to the service account.

**Step 2** Edit the log.conf file to increase the size of the log to accommodate the additional log statements.

```
vi /usr/cids/idsRoot/etc/log.conf
```

**Step 3** Change `fileMaxSizeInK=500` to `fileMaxSizeInK=5000`.

**Step 4** Locate the zone and CID section of the file and set the severity to debug.

```
severity=debug
```

**Step 5** Save the file, exit the vi editor, and exit the service account.

**Step 6** Log in to the CLI as administrator.

**Step 7** Enter master control submode.

```
sensor# configure terminal
sensor(config)# service logger
sensor(config-log)# master-control
```

**Step 8** Enable debug logging for all zones.

```
sensor(config-log-mas)# enable-debug true
sensor(config-log-mas)# show settings
   master-control
   -----------------------------------------------
      enable-debug: true default: false
      individual-zone-control: false <defaulted>
   -----------------------------------------------
sensor(config-log-mas)#
```

**Step 9** Turn on individual zone control.

```
sensor(config-log-mas)# individual-zone-control true
sensor(config-log-mas)# show settings
   master-control
   -----------------------------------------------
      enable-debug: true default: false
      individual-zone-control: true default: false
   -----------------------------------------------
sensor(config-log-mas)#
```

**Step 10** Exit master zone control.

```
sensor(config-log-mas)# exit
```

**Step 11** View the zone names.

```
sensor(config-log)# show settings
   master-control
   -----------------------------------------------
      enable-debug: false <defaulted>
      individual-zone-control: true default: false
   -----------------------------------------------
   zone-control (min: 0, max: 999999999, current: 14)
   -----------------------------------------------
      <protected entry>
      zone-name: AuthenticationApp
      severity: warning <defaulted>
      <protected entry>
      zone-name: Cid
      severity: debug <defaulted>
      <protected entry>
      zone-name: Cli
      severity: warning <defaulted>
      <protected entry>
      zone-name: IdapiCtlTrans
      severity: warning <defaulted>
      <protected entry>
      zone-name: IdsEventStore
      severity: warning <defaulted>
      <protected entry>
      zone-name: MpInstaller
      severity: warning <defaulted>
      <protected entry>
      zone-name: cmgr
      severity: warning <defaulted>
      <protected entry>
      zone-name: cplane
```

```
      severity: warning <defaulted>
      <protected entry>
      zone-name: csi
      severity: warning <defaulted>
      <protected entry>
      zone-name: ctlTransSource
      severity: warning <defaulted>
      <protected entry>
      zone-name: intfc
      severity: warning <defaulted>
      <protected entry>
      zone-name: nac
      severity: warning <defaulted>
      <protected entry>
      zone-name: sensorApp
      severity: warning <defaulted>
      <protected entry>
      zone-name: tls
      severity: warning <defaulted>
   ------------------------------------------------
sensor(config-log)#
```

**Step 12** Change the severity level (debug, timing, warning, or error) for a particular zone.

```
sensor(config-log)# zone-control IdsEventStore severity error
sensor(config-log)# show settings
   master-control
   ------------------------------------------------
      enable-debug: true default: false
      individual-zone-control: true default: false
   ------------------------------------------------
   zone-control (min: 0, max: 999999999, current: 14)
   ------------------------------------------------
      <protected entry>
      zone-name: AuthenticationApp
      severity: warning <defaulted>
      <protected entry>
      zone-name: Cid
      severity: debug <defaulted>
      <protected entry>
      zone-name: Cli
      severity: warning <defaulted>
      <protected entry>
      zone-name: IdapiCtlTrans
      severity: warning <defaulted>
      <protected entry>
      zone-name: IdsEventStore
      severity: error default: warning
      <protected entry>
      zone-name: MpInstaller
      severity: warning <defaulted>
      <protected entry>
      zone-name: cmgr
      severity: warning <defaulted>
      <protected entry>
      zone-name: cplane
      severity: warning <defaulted>
      <protected entry>
      zone-name: csi
      severity: warning <defaulted>
      <protected entry>
      zone-name: ctlTransSource
      severity: warning <defaulted>
      <protected entry>
```

```
      zone-name: intfc
      severity: warning <defaulted>
      <protected entry>
      zone-name: nac
      severity: warning <defaulted>
      <protected entry>
      zone-name: sensorApp
      severity: warning <defaulted>
      <protected entry>
      zone-name: tls
      severity: warning <defaulted>
   -----------------------------------------------
sensor(config-log)#
```

**Step 13** Turn on debugging for a particular zone.

```
sensor(config-log)# zone-control nac severity debug
sensor(config-log)# show settings
   master-control
   -----------------------------------------------
      enable-debug: true default: false
      individual-zone-control: true default: false
   -----------------------------------------------
   zone-control (min: 0, max: 999999999, current: 14)
   -----------------------------------------------
      <protected entry>
      zone-name: AuthenticationApp
      severity: warning <defaulted>
      <protected entry>
      zone-name: Cid
      severity: debug <defaulted>
      <protected entry>
      zone-name: Cli
      severity: warning <defaulted>
      <protected entry>
      zone-name: IdapiCtlTrans
      severity: warning <defaulted>
      <protected entry>
      zone-name: IdsEventStore
      severity: error default: warning
      <protected entry>
      zone-name: MpInstaller
      severity: warning <defaulted>
      <protected entry>
      zone-name: cmgr
      severity: warning <defaulted>
      <protected entry>
      zone-name: cplane
      severity: warning <defaulted>
      <protected entry>
      zone-name: csi
      severity: warning <defaulted>
      <protected entry>
      zone-name: ctlTransSource
      severity: warning <defaulted>
      <protected entry>
      zone-name: intfc
      severity: warning <defaulted>
      <protected entry>
      zone-name: nac
      severity: debug default: warning
      <protected entry>
      zone-name: sensorApp
      severity: warning <defaulted>
```

```
      <protected entry>
      zone-name: tls
      severity: warning <defaulted>
   ------------------------------------------------
sensor(config-log)#
```

**Step 14** Exit the logger submode.

```
sensor(config-log)# exit
Apply Changes:?[yes]:
```

**Step 15** Press **Enter** to apply changes or type **no** to discard them:

### For More Information

For a list of what each zone name refers to, see Zone Names, page E-49.

## Zone Names

Table E-2 lists the debug logger zone names:

***Table E-2 Debug Logger Zone Names***

| Zone Name | Description |
|---|---|
| AD | Anomaly Detection zone |
| AuthenticationApp | Authentication zone |
| Cid | General logging zone |
| Cli | CLI zone |
| IdapiCtlTrans | All control transactions zone |
| IdsEventStore | Event Store zone |
| MpInstaller | IDSM-2 master partition installer zone |
| cmgr | Card Manager service zone[1] |
| cplane | Control Plane zone[2] |
| csi | CIDS Servlet Interface[3] |
| ctlTransSource | Outbound control transactions zone |
| intfc | Interface zone |
| nac | ARC zone |
| rep | Reputation zone |
| sched | Automatic update scheduler zone |
| sensorApp | AnalysisEngine zone |
| tls | SSL and TLS zone |

1. The Card Manager service is used on the AIP SSM to exchange control and state information between modules in the chassis.
2. The Control Plane is the transport communications layer used by Card Manager on the AIP SSM.
3. The CIDS servlet interface is the interface layer between the CIDS web server and the servlets.

### For More Information

To learn more about the IPS Logger service, refer to Logger.

## Directing cidLog Messages to SysLog

It might be useful to direct cidLog messages to syslog.

To direct cidLog messages to syslog, follow these steps:

**Step 1** Go to the idsRoot/etc/log.conf file.

**Step 2** Make the following changes:

**a.** Set [logApp] `enabled=false`

Comment out the `enabled=true` because `enabled=false` is the default.

**b.** Set [drain/main] `type=syslog`

The following example shows the logging configuration file:

```
timemode=local
;timemode=utc

[logApp]
;enabled=true
;-------- FIFO parameters --------
fifoName=logAppFifo
fifoSizeInK=240
;-------- logApp zone and drain parameters --------
zoneAndDrainName=logApp
fileName=main.log
fileMaxSizeInK=500

[zone/Cid]
severity=warning
drain=main

[zone/IdsEventStore]
severity=debug
drain=main

[drain/main]
type=syslog
```

The syslog output is sent to the syslog facility local6 with the following correspondence to syslog message priorities:

```
LOG_DEBUG,         //   debug
LOG_INFO,              //    timing
LOG_WARNING,    //    warning
LOG_ERR,               //    error
LOG_CRIT               //     fatal
```

**Note** Make sure that your /etc/syslog.conf has that facility enabled at the proper priority.

**Caution** The syslog is much slower than logApp (about 50 messages per second as opposed to 1000 or so). We recommend that you enable debug severity on one zone at a time.

# TCP Reset Not Occurring for a Signature

If you do not have the event action set to reset, the TCP reset does not occur for a specific signature.

**Note** TCP Resets are not supported over MPLS links or the following tunnels: GRE, IPv4 in IPv4, IPv6 in IPv4, or IPv4 in IPv6.

To troubleshoot a reset not occurring for a specific signature, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Make sure the event action is set to TCP reset.

```
sensor# configure terminal
sensor(config)# service signature-definition sig0
sensor(config-sig)# signatures 1000 0
sensor(config-sig-sig)# engine atomic-ip
sensor(config-sig-sig-ato)# event-action reset-tcp-connection|produc-alert
sensor(config-sig-sig-ato)# show settings
   atomic-ip
   -----------------------------------------------
      event-action: produce-alert|reset-tcp-connection default: produce-alert
      fragment-status: any <defaulted>
      specify-l4-protocol
      -----------------------------------------------
         no
         -----------------------------------------------
         -----------------------------------------------
      -----------------------------------------------
      specify-ip-payload-length
      -----------------------------------------------
         no
         -----------------------------------------------
         -----------------------------------------------
      -----------------------------------------------
      specify-ip-header-length
      -----------------------------------------------
         no
         -----------------------------------------------
         -----------------------------------------------
      -----------------------------------------------
      specify-ip-tos
      -----------------------------------------------
--MORE--
```

**Step 3** Exit signature definition submode.

```
sensor(config-sig-sig-ato)# exit
sensor(config-sig-sig)# exit
sensor(config-sig)# exit
Apply Changes:?[yes]:
```

**Step 4** Press **Enter** to apply the changes or type **no** to discard them.

**Step 5** Make sure the correct alarms are being generated.

```
sensor# show events alert
evAlert: eventId=1047575239898467370 severity=medium
originator:
hostId: sj_4250_40
appName: sensorApp
appInstanceId: 1004
signature: sigId=20000 sigName=STRING.TCP subSigId=0 version=Unknown
addr: locality=OUT 172.16.171.19
port: 32771
victim:
addr: locality=OUT 172.16.171.13 port: 23
actions:
tcpResetSent: true
```

**Step 6** Make sure the switch is allowing incoming TCP reset packet from the sensor. Refer to your switch documentation for more information.

**Step 7** Make sure the resets are being sent.

```
root# ./tcpdump -i eth0 src host 172.16.171.19
tcpdump: WARNING: eth0: no IPv4 address assigned
tcpdump: listening on eth0
13:58:03.823929 172.16.171.19.32770 > 172.16.171.13.telnet: R 79:79(0) ack 62 win 0
13:58:03.823930 172.16.171.19.32770 > 172.16.171.13.telnet: R 80:80(0) ack 62 win 0
13:58:03.823930 172.16.171.19.32770 > 172.16.171.13.telnet: R 80:80(0) ack 62 win 0
13:58:03.823930 172.16.171.19.32770 > 172.16.171.13.telnet: R 80:80(0) ack 62 win 0
```

# Software Upgrades

This section helps in troubleshooting software upgrades. It contains the following topics:


- Upgrading and Analysis Engine, page E-52
- Which Updates to Apply and Their Prerequisites, page E-53
- Issues With Automatic Update, page E-53
- Updating a Sensor with the Update Stored on the Sensor, page E-54


## Upgrading and Analysis Engine

When you upgrade an IPS sensor, you may receive an error that the Analysis Engine is not running:

```
sensor# upgrade scp://user@10.1.1.1/upgrades/IPS-K9-7.1-2-E4.pkg
Password: ********
Warning: Executing this command will apply a major version upgrade to the application
partition. The system may be rebooted to complete the upgrade.
Continue with upgrade?: yes
Error: AnalysisEngine is not running. Please reset box and attempt upgrade again.
```

If you receive this error, you must get the Analysis Engine running before trying to upgrade again. This error is often caused by a defect in the currently running version. Try rebooting the sensor, and after reboot, run the **setup** command and remove the interfaces from the virtual sensor vs0. When it is not monitoring traffic, Analysis Engine usually stays up and running. You can upgrade at this time. After the upgrade, add the interfaces back to the virtual sensor vs0 using the **setup** command.

Or you can use the system image file to reimage the sensor directly to the version you want. You can reimage a sensor and avoid the error because the reimage process does not check to see if the Analysis Engine is running.

**Caution** Reimaging using the system image file restores all configuration defaults.

#### For More Information

- For more information on running the **setup** command, see Appendix B, "Initializing the Sensor."
- For more information on reimaging your sensor, see Chapter D, "Upgrading, Downgrading, and Installing System Images."

## Which Updates to Apply and Their Prerequisites

You must have the correct service pack and minor and major version of the software. If you are having trouble with applying new software, make sure that you are applying the proper updates with the proper prerequisites:

- Signature updates require the minimum version and engine version listed in the filename.
- Engine updates require the major or minor version in the engine update filename. Service packs require the correct minor version.
- Minor versions require the correct major version.
- Major versions require the previous major version.

#### For More Information

To understand how to interpret the IPS software filenames, see IPS Software Versioning, page C-3.

## Issues With Automatic Update

**Caution** In IPS 7.1(5)E4 and later the default value of the Cisco server IP address has been changed from 198.133.219.25 to 72.163.4.161 in the Auto Update URL configuration. If you have automatic update configured on your sensor, you may need to update firewall rules to allow the sensor to connect to this new IP address.

The following list provides suggestions for troubleshooting automatic updates:

- Run TCPDUMP:
  - Create a service account. **Su** to root and run TCPDUMP on the command and control interface to capture packets between the sensor and the FTP server.
  - Use the **upgrade** command to manually upgrade the sensor.
  - Look at the TCPDUMP output for errors coming back from the FTP server.
- Make sure the sensor is in the correct directory. The directory must be specified correctly. This has caused issues with Windows FTP servers. Sometimes an extra "/" or even two "/" are needed in front of the directory name. To verify this, use the same FTP commands you see in the TCPDUMP output through your own FTP connection.
- You must use the Windows FTP server setup option to emulate UNIX file structure and not MS-DOS file structure.

- If you are using SCP, make sure you have added the SSH host key to the known hosts list.
- If you get an unauthorized error message while configuring an automatic update, make sure you have the correct ports open on any firewalls between the sensor and Cisco.com. For example, you need port 443 for the initial automatic update connection to www.cisco.com, and you need port 80 to download the chosen package from a Cisco file server. The IP address may change for the Cisco file server, but you can find it in the lastDownloadAttempt section in the output of the **show statistics host** command.

Try the manual **upgrade** command before attempting the automatic update. If it works with the **upgrade** command and does not work with the automatic update, try the following:

- Determine which IPS software version your sensor has.
- Make sure the passwords are configured for automatic update. Make sure they match the same passwords used for manual update.
- Make sure that the filenames in the FTP server are exactly what you see on Downloads on Cisco.com. This includes capitalization. Some Windows FTP servers allow access to the file with the incorrect capitalization but the sensor ultimately rejects the file because the name has changed.
- If necessary, run TCPDUMP on automatic update. You can compare the successful manual update with the unsuccessful automatic update and troubleshoot from there.

#### For More Information

- For the procedure for creating the service account, see Creating the Service Account, page E-5.
- For the procedure for reimaging your sensor, see Chapter D, "Upgrading, Downgrading, and Installing System Images."
- For the procedure for adding hosts to the SSH known hosts list, refer to Adding Hosts to the SSH Known Hosts List.
- For the procedure for determining the software version, see Version Information, page E-82.

## Updating a Sensor with the Update Stored on the Sensor

You can store the update package in the /var directory on the sensor and update the sensor from there if you need to.

To update the sensor with an update stored on the sensor, follow these steps:

**Step 1** Log in to the service account.

**Step 2** Obtain the update package file from Cisco.com.

**Step 3** FTP or SCP the update file to the sensor /usr/cids/idsRoot/var directory.

**Step 4** Set the file permissions:.

```
chmod 644 ips_package_file_name
```

**Step 5** Exit the service account.

**Step 6** Log in to the sensor using an account with administrator privileges.

**Step 7** Store the sensor host key.

```
sensor# configure terminal
sensor(config)# service ssh
sensor(config-ssh)# rsa1-keys sensor_ip_address
```

**Step 8** Upgrade the sensor.

```
sensor(config)# upgrade scp://service@sensor_ip_address/upgrade/ips_package_file_name
Enter password: *****
Re-enter password: *****
```

**For More Information**

For the procedure for obtaining Cisco IPS software, see Obtaining Cisco IPS Software, page C-1.

# Troubleshooting the IDM

**Note** These procedures also apply to the IPS section of ASDM.

**Note** After you upgrade any IPS software on your sensor, you must restart the IDM to see the latest software features.

This section contains troubleshooting procedures for the IDM. It contains the following topics:


- Cannot Launch IDM - Loading Java Applet Failed, page E-55
- Cannot Launch the IDM-the Analysis Engine Busy, page E-56
- The IDM, Remote Manager, or Sensing Interfaces Cannot Access the Sensor, page E-56
- Signatures Not Producing Alerts, page E-57


## Cannot Launch IDM - Loading Java Applet Failed

**Symptom** The browser displays `Loading Cisco IDM. Please wait ...` At the bottom left corner of the window, `Loading Java Applet Failed` is displayed.

**Possible Cause** This condition can occur if multiple Java Plug-ins are installed on the machine on which you are launching the IDM.

**Recommended Action** Clear the Java cache and remove temp files and clear history in the browser you are using. The result is that neither of these plug-ins will be used by default and each applet should use the correct plug-in.

To clear the cache, follow these steps:

**Step 1** Close all browser windows.

**Step 2** If you have Java Plug-in 1.3.*x* installed:

a. Click **Start > Settings > Control Panel > Java Plug-in 1.3.x**.

b. Click the **Advanced** tab.

c. Under Java Runtime Environment, select **JRE 1.3.x** from the drop-down menu.

d. Click the **Cache** tab.

e. Click **Clear**.

**Step 3** If you have Java Plug-in 1.4.*x* installed:

a. Click **Start > Settings > Control Panel > Java Plug-in 1.4.x**.

b. Click the **Advanced** tab.

c. Under Java Runtime Environment, select **JRE 1.3.x** from the drop-down menu.

d. Click the **Cache** tab.

e. Click the **Browser** tab.

f. Deselect all browser check boxes.

g. Click **Clear Cache**.

**Step 4** Delete the temp files and clear the history in the browser.

# Cannot Launch the IDM-the Analysis Engine Busy

**Error Message** `Error connecting to sensor. Failed to load sensor-errNotAvailable-Analysis Engine is busy. Exiting IDM.`

**Possible Cause** This condition can occur if the Analysis Engine in the sensor is busy getting ready to perform a task and so does not respond to the IDM.

**Recommended Action** Wait for a while and try again to connect.

# The IDM, Remote Manager, or Sensing Interfaces Cannot Access the Sensor

If the IDM, a remote manager, or sensing interfaces cannot access the sensor, but you can access the sensor CLI using SSH or Telnet (if enabled), follow these steps:

**Step 1** Make sure the network configuration allows access to the web server port that is configured on the sensor:

```
sensor# setup


    --- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
User ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.


Current Configuration:


service host
network-settings
host-ip 192.168.1.2/24,192.168.1.1
host-name sensor
```

```
telnet-option enabled
access-list 0.0.0.0/0
ftp-timeout 300
no login-banner-text
exit
time-zone-settings
offset 0
standard-time-zone-name UTC
exit
summertime-option disabled
ntp-option disabled
exit
service web-server
port 443
exit
```

**Step 2** If network devices, such as routers, switches, or firewalls, are between the sensor and the workstation, make sure these devices are configured to allow the workstation to access the sensor web server port. All remote management communication is performed by the sensor web server.

#### For More Information

For the procedure for enabling and disabling Telnet on the sensor, and configuring the web server, refer to Changing Network Settings.

## Signatures Not Producing Alerts

**Caution** You cannot add other actions each time you configure the event actions. You are actually replacing the list of event actions every time you configure it, so make sure you choose Produce Alert every time you configure event actions.

If you are not seeing any alerts when signatures are firing, make sure that you have configured Produce Alert as an event action. For example, if you choose Produce Alert, but later add another event action and do not add Produce Alert to the new configuration, alerts are not sent to the Event Store. To make sure you are getting alerts, check the statistics for the virtual sensor and the Event Store.

#### For More Information

- For more information about event actions, refer to Event Actions.
- For the procedure for configuring event actions, refer to Assigning Actions to Signatures.
- For the procedure for obtaining statistics about virtual sensor and Event Store, refer to Displaying Statistics.

# Troubleshooting the IME

This section describes troubleshooting tools for the IME, and contains the following sections:

- Time Synchronization on the IME and the Sensor, page E-58
- Not Supported Error Message, page E-58
- Installation Error, page E-58

# Time Synchronization on the IME and the Sensor

**Symptom** The IME displays `No Data Available` on the Events dashboard. A historical query does not return any events; however, events are coming in to the IME and they appear in the real-time event viewer.

**Possible Cause** The time is not synchronized between the sensor and the IME local server. The IME dashboards use a time relative to the IME local time. If these times are not synchronized, the query does not return any results. When you add a sensor to the IME, it checks for the time synchronization and warns you to correct it if is in wrong. The IME also displays a clock warning in Home > Devices > Device List to warn you about problems with synchronization.

**Recommended Action** Change the time settings on the sensor or the IME local server. In most cases, the time change is required for the sensor because it is configured with the incorrect or default time.

**For More Information**

- For more information on time and the sensor, see Time Sources and the Sensor, page E-15.
- For the procedure for changing the time on the sensor, see Correcting Time on the Sensor, page E-17.

# Not Supported Error Message

**Symptom** The IME displays `Not Supported` in the device list table and in some gadgets, and no data is included.

**Possible Cause** Click **Details** to see an explanation for this message. The IME needs IPS 6.1 or later to obtain certain information. The IME still operates with event monitoring and reporting for IPS 5.0 and later and specific IOS IPS versions, but some functions, such as health information and integrated configuration, are not available.

**Recommended Action** Upgrade to IPS 6.1 or later.

# Installation Error

**Symptom** IME 7.1.1 installation is failing with the following error message: `Unhandled Exception. Error Number: 0x80004005, Description: Unspecified Error. Setup will now terminate.`

**Conditions** You are trying to install the IME over an RDP connection, which has 8-bit color depth or 256 colors. This is an InstallShield error.

**Workaround** Increase the color depth of the RDP connection to at least 16 bits.

# Troubleshooting the ASA 5500 AIP SSM

**Tip** Before troubleshooting the ASA 5500 AIP SSM, check the Caveats section of the Readme for the software version you have installed on your sensor to see if you are dealing with a known issue.

The following section contains commands that are specific to troubleshooting ASA 5500 AIP SSM:


- Health and Status Information, page E-59
- Failover Scenarios, page E-61
- The ASA 5500 AIP SSM and the Normalizer Engine, page E-62
- The ASA 5500 AIP SSM and the Data Plane, page E-63
- The ASA 5500 AIP SSM and Jumbo Packet Frame Size, page E-63
- The ASA 5500 AIP SSM and Jumbo Packets, page E-63
- TCP Reset Differences Between IPS Appliances and ASA IPS Modules, page E-64
- IPS Reloading Messages, page E-64


## Health and Status Information

To see the general health of the ASA 5500 AIP SSM, use the **show module 1 details** command:

```
asa# show module 1 details
Getting details from the Service Module, please wait...
ASA 5500 Series Security Services Module-20
Model:              ASA-SSM-20
Hardware version:   0.2
Serial Number:      P2B000005D0
Firmware version:   1.0(10)0
Software version:   5.1(0.1)S153.0
Status:             Up
Mgmt IP addr:       192.0.2.0
Mgmt web ports:     443
Mgmt TLS enabled:   true
asa#
```

The output shows that the ASA 5500 AIP SSM is up. If the status reads `Down`, you can reset the module using the **hw-module module 1 reset** command:

```
asa# hw-module module 1 reset
The module in slot 1 should be shut down before
resetting it or loss of configuration may occur.
Reset module in slot 1? [confirm]
Reset issued for module in slot 1
asa(config)# show module

Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
  0 ASA 5520 Adaptive Security Appliance         ASA5520            P2A00000014
  1 ASA 5500 Series Security Services Module-10  ASA-SSM-10         P2A0000067U

Mod MAC Address Range                 Hw Version   Fw Version   Sw Version
--- --------------------------------- ------------ ------------ ---------------
  0 000b.fcf8.7bdc to 000b.fcf8.7be0  0.2          1.0(10)0     7.0(4)
  1 000b.fcf8.0176 to 000b.fcf8.0176  0.2          1.0(10)0     5.1(0.1)S153.0
```

```
Mod Status
--- ------------------
  0 Up Sys
  1 Shutting Down
************************************************
asa(config)# show module

Mod Card Type                                    Model              Serial No.
--- -------------------------------------------- ------------------ -----------
  0 ASA 5520 Adaptive Security Appliance         ASA5520            P2A00000014
  1 ASA 5500 Series Security Services Module-10  ASA-SSM-10         P2A0000067U

Mod MAC Address Range                 Hw Version   Fw Version   Sw Version
--- --------------------------------- ------------ ------------ ---------------
  0 000b.fcf8.7bdc to 000b.fcf8.7be0  0.2          1.0(10)0     7.0(4)
  1 000b.fcf8.0176 to 000b.fcf8.0176  0.2          1.0(10)0     5.1(0.1)S153.0

Mod Status
--- ------------------
  0 Up Sys
  1 Up
asa(config)#
```

If you have problems with reimaging the ASA 5500 AIP SSM, use the **debug module-boot** command to see the output as the module boots. Make sure you have the correct IP address for the TFTP server and you have the correct file on the TFTP server. Then use the **hw-module module 1 recover** command again to reimage the module:

```
asa(config)# hw-module module 1 recover configure
Image URL [tftp://0.0.0.0/]: tftp://192.0.2.0/IPS-SSM-K9-sys-1.1-a-5.1-0.1.i$
Port IP Address [0.0.0.0]: 10.89.150.227
VLAN ID [0]:
Gateway IP Address [0.0.0.0]: 10.89.149.254
asa(config)# debug module-boot
debug module-boot  enabled at level 1
asa(config)# hw-module module 1 recover boot
The module in slot 1 will be recovered.  This may erase all configuration and all data on
that device and attempt to download a new image for it.
Recover module in slot 1? [confirm]
Recover issued for module in slot 1
asa(config)# Slot-1 140> Cisco Systems ROMMON Version (1.0(10)0) #0: Fri Mar 25 23:02:10
PST 2005
Slot-1 141> Platform ASA-SSM-10
Slot-1 142> GigabitEthernet0/0
Slot-1 143> Link is UP
Slot-1 144> MAC Address: 000b.fcf8.0176
Slot-1 145> ROMMON Variable Settings:
Slot-1 146>   ADDRESS=10.89.150.227
Slot-1 147>   SERVER=10.89.146.1
Slot-1 148>   GATEWAY=10.89.149.254
Slot-1 149>   PORT=GigabitEthernet0/0
Slot-1 150>   VLAN=untagged
Slot-1 151>   IMAGE=IPS-SSM-K9-sys-1.1-a-5.1-0.1.img
Slot-1 152>   CONFIG=
Slot-1 153>   LINKTIMEOUT=20
Slot-1 154>   PKTTIMEOUT=4
Slot-1 155>   RETRY=20
Slot-1 156> tftp IPS-SSM-K9-sys-1.1-a-5.1-0.1.img@10.89.146.1 via 10.89.149.254
Slot-1 157> TFTP failure: Packet verify failed after 20 retries
Slot-1 158> Rebooting due to Autoboot error ...
Slot-1 159> Rebooting....
Slot-1 160> Cisco Systems ROMMON Version (1.0(10)0) #0: Fri Mar 25 23:02:10 PST 2005
```

```
Slot-1 161> Platform ASA-SSM-10
Slot-1 162> GigabitEthernet0/0
Slot-1 163> Link is UP
Slot-1 164> MAC Address: 000b.fcf8.0176
Slot-1 165> ROMMON Variable Settings:
Slot-1 166>   ADDRESS=10.89.150.227
Slot-1 167>   SERVER=10.89.146.1
Slot-1 168>   GATEWAY=10.89.149.254
Slot-1 169>   PORT=GigabitEthernet0/0
Slot-1 170>   VLAN=untagged
Slot-1 171>   IMAGE=IPS-SSM-K9-sys-1.1-a-5.1-0.1.img
Slot-1 172>   CONFIG=
Slot-1 173>   LINKTIMEOUT=20
Slot-1 174>   PKTTIMEOUT=4
Slot-1 175>   RETRY=20
Slot-1 176> tftp IPS-SSM-K9-sys-1.1-a-5.1-0.1.img@10.89.146.1 via 10.89.149.254
```

# Failover Scenarios

The following failover scenarios apply to the ASA in the event of configuration changes, signature/signature engine updates, service packs, and SensorApp crashes on the ASA 5500 AIP SSM.

### Single ASA in Fail-Open Mode

- If the ASA is configured in fail-open mode for the ASA 5500 AIP SSM, and the ASA 5500 AIP SSM experiences a configuration change or signature/signature engine update, traffic is passed through the ASA without being inspected.
- If the ASA is configured in fail-open mode for the ASA 5500 AIP SSM, and the ASA 5500 AIP SSM experiences a SensorApp crash or a service pack upgrade, traffic is passed through the ASA without being inspected.

### Single ASA in Fail-Close Mode

- If the ASA is configured in fail-close mode for the ASA 5500 AIP SSM, and the ASA 5500 AIP SSM experiences a configuration change or a signature/signature engine update, traffic is stopped from passing through the ASA.
- If the ASA is configured in fail-close mode for the ASA 5500 AIP SSM, and the ASA 5500 AIP SSM experiences a SensorApp crash or a service pack upgrade, traffic is stopped from passing through the ASA.

### Two ASAs in Fail-Open Mode

- If the ASAs are configured in fail-open mode and if the ASA 5500 AIP SSM on the active ASA experiences a configuration change or a signature/signature engine update, traffic is still passed through the active ASA without being inspected. Failover is not triggered.
- If the ASAs are configured in fail-open mode, and if the ASA 5500 AIP SSM on the active ASA experiences a SensorApp crash or a service pack upgrade, failover is triggered and traffic passes through the ASA 5500 AIP SSM that was previously the standby module.

### Two ASAs in Fail-Close Mode

- If the ASAs are configured in fail-close mode, and if the ASA 5500 AIP SSM on the active ASA experiences a configuration change or a signature/signature engine update, traffic is stopped from passing through the active ASA. No failover is triggered.

- If the ASAs are configured in fail-close mode, and if the ASA 5500 AIP SSM on the active ASA experiences a SensorApp crash or a service pack upgrade, failover is triggered and traffic passes through the module that was previously the standby for the ASA 5500 AIP SSM.

### Configuration Examples

Use the following configuration for the primary ASA:

```
interface GigabitEthernet0/7
 description LAN Failover Interface

failover
failover lan unit primary
failover lan interface folink GigabitEthernet0/7
failover interface ip folink 172.27.48.1 255.255.255.0 standby 172.27.48.2
```

Use the following configuration for the secondary ASA:

```
interface GigabitEthernet0/7
 description LAN Failover Interface

failover
failover lan unit secondary
failover lan interface folink GigabitEthernet0/7
failover interface ip folink 172.27.48.1 255.255.255.0 standby 172.27.48.2
```

## The ASA 5500 AIP SSM and the Normalizer Engine

The majority of the features in the Normalizer engine are not used on the ASA 5500 AIP SSM, because the ASA itself handles the normalization. Packets on the ASA IPS modules go through a special path in the Normalizer that only reassembles fragments and puts packets in the right order for the TCP stream. The Normalizer does not do any of the normalization that is done on an inline IPS appliance, because that causes problems in the way the ASA handles the packets.

The following Normalizer engine signatures are not supported:

- 1300.0
- 1304.0
- 1305.0
- 1307.0
- 1308.0
- 1309.0
- 1311.0
- 1315.0
- 1316.0
- 1317.0
- 1330.0
- 1330.1
- 1330.2
- 1330.9
- 1330.10

- 1330.12
- 1330.14
- 1330.15
- 1330.16
- 1330.17
- 1330.18

**For More Information**

For detailed information about the Normalizer engine, see Normalizer Engine.

# The ASA 5500 AIP SSM and the Data Plane

**Symptom** The ASA 5500 AIP SSM data plane is kept in the Up state while applying signature updates. You can check the ASA 5500 AIP SSM data plane status by using the **show module** command during signature updates.

**Possible Cause** Bypass mode is set to off. The issue is seen when updating signatures, and when you use either CSM or IDM to apply signature updates. This issue is not seen when upgrading IPS system software.

# The ASA 5500 AIP SSM and Jumbo Packet Frame Size

Refer to the following URL for information about ASA 5500 AIP SSM jumbo packet frame size:

http://www.cisco.com/en/US/docs/security/asa/asa84/configuration/guide/interface_start.html#wp1328869

**Note** A jumbo frame is an Ethernet packet that is larger than the standard maximum of 1518 bytes (including Layer 2 header and FCS).

# The ASA 5500 AIP SSM and Jumbo Packets

The jumbo packet count in the **show interface** command output from the lines `Total Jumbo Packets Received` and `Total Jumbo Packets Transmitted` for ASA IPS modules may be larger than expected due to some packets that were almost jumbo size on the wire being counted as jumbo size by the IPS. This miscount is a result of header bytes added to the packet by the ASA before the packet is transmitted to the IPS. For IPv4, 58 bytes of header data are added. For IPv6, 78 bytes of header data are added. The ASA removes the added IPS header before the packet leaves the ASA.

# TCP Reset Differences Between IPS Appliances and ASA IPS Modules

The IPS appliance sends TCP reset packets to both the attacker and victim when Reset TCP Connection is selected. The IPS appliance sends a TCP reset packet only to the victim under the following circumstances:

- When a Deny Packet Inline or Deny Connection Inline is selected
- When TCP-based signatures and Reset TCP Connection have NOT been selected

In the case of the ASA IPS module, the TCP reset request is sent to the ASA, and the ASA then sends the TCP reset packets. The ASA sends TCP reset packets to both the attacker and victim when the Reset TCP Connection is selected. When Deny Packet Inline or Deny Connection Inline is selected, the ASA sends the TCP reset packet to either the attacker or victim depending on the configuration of the signature. Signatures configured to swap the attacker and victim when reporting the alert can cause the ASA to send the TCP reset packet to the attacker.

### For More Information

For detailed information about event actions, refer to Event Actions.

# IPS Reloading Messages

**Symptom** ASA syslog messages similar to the following are observed and the root cause of the message is not clear:

```
%ASA-1-505013: ASA-SSM-10 Module in slot 1, application reloading "IPS", version
"7.1(6)E4" Config Change
%ASA-1-505013: ASA5585-SSP-IPS10 Module in slot 1, application reloading "IPS", version
"7.1(1)E4" Config Change
```

These messages occur once an hour for sensors not actively being configured or more often for sensors being configured.

**Conditions** ASA adaptive appliances running an affected software version with an ASA IPS module (ASA 5500 AIP SSMASA 5500-X IPS SSPASA 5585-X IPS SSP) installed that is running IPS 7.1 or later. The common cause for these messages is global correlation and/or signature updates occurring on the ASA IPS module that results in these messages being generated for some, but not necessarily all of the updates, which are attempted every five minutes.

**Workaround** None. The cause of these messages can be confirmed on the sensor module by reviewing the **show events status** *past* command output and identifying a status event that corresponds to the ASA syslog message that matches the date and time. The sensor's status event should provide further details about what operation occurred that resulted in the ASA syslog message.

# Troubleshooting the ASA 5500-X IPS SSP

**Tip** Before troubleshooting the ASA 5500-X IPS SSP, check the Caveats section of the Readme for the software version installed on your sensor to see if you are dealing with a known issue.

This section contains troubleshooting information specific to the ASA 5500-X IPS SSP, and contains the following topics:


- Failover Scenarios, page E-65
- Health and Status Information, page E-66
- The ASA 5500-X IPS SSP and the Normalizer Engine, page E-67
- The ASA 5500-X IPS SSP and Memory Usage, page E-68
- The ASA 5500-X IPS SSP and Jumbo Packet Frame Size, page E-69
- The ASA 5500-X IPS SSP and Jumbo Packets, page E-69
- TCP Reset Differences Between IPS Appliances and ASA IPS Modules, page E-69
- IPS Reloading Messages, page E-70
- IPS Not Loading, page E-70


# Failover Scenarios

The following failover scenarios apply to the ASAS 5500-X in the event of configuration changes, signature/signature engine updates, service packs, and SensorApp crashes on theASA 5500-X IPS SSP.

### Single ASA 5500-X in Fail-Open Mode

- If the ASA is configured in fail-open mode for the ASA 5500-X IPS SSP, and the ASA 5500-X IPS SSP experiences a configuration change or signature/signature engine update, traffic is passed through the ASA without being inspected.
- If the ASA is configured in fail-open mode for the ASA 5500-X IPS SSP, and the ASA 5500-X IPS SSP experiences a SensorApp crash or a service pack upgrade, traffic is passed through the ASA without being inspected.

### Single ASA 5500-X in Fail-Close Mode

- If the ASA is configured in fail-close mode for the ASA 5500-X IPS SSP, and the ASA 5500-X IPS SSP experiences a configuration change or a signature/signature engine update, traffic is stopped from passing through the ASA.
- If the ASA is configured in fail-close mode for the ASA 5500-X IPS SSP, and the ASA 5500-X IPS SSP experiences a SensorApp crash or a service pack upgrade, traffic is stopped from passing through the ASA.

### Two ASA 5500-Xs in Fail-Open Mode

- If the ASAs are configured in fail-open mode and if the ASA 5500-X IPS SSP on the active ASA experiences a configuration change or a signature/signature engine update, traffic is still passed through the active ASA without being inspected. Failover is not triggered.
- If the ASAs are configured in fail-open mode, and if the ASA 5500-X IPS SSP on the active ASA experiences a SensorApp crash or a service pack upgrade, failover is triggered and traffic passes through the ASA 5500-X IPS SSP that was previously the standby ASA 5500-X IPS SSP.

### Two ASA 5500-Xs in Fail-Close Mode

- If the ASAs are configured in fail-close mode, and if the ASA 5500-X IPS SSP on the active ASA experiences a configuration change or a signature/signature engine update, traffic is stopped from passing through the active ASA. No failover is triggered.

- If the ASAs are configured in fail-close mode, and if the ASA 5500-X IPS SSP on the active ASA experiences a SensorApp crash or a service pack upgrade, failover is triggered and traffic passes through the ASA 5500-X IPS SSP that was previously the standby for the ASA 5500-X IPS SSP.

### Configuration Examples

Use the following configuration for the primary ASA:

```
interface GigabitEthernet0/7
 description LAN Failover Interface

failover
failover lan unit primary
failover lan interface folink GigabitEthernet0/7
failover interface ip folink 172.27.48.1 255.255.255.0 standby 172.27.48.2
```

Use the following configuration for the secondary ASA:

```
interface GigabitEthernet0/7
 description LAN Failover Interface

failover
failover lan unit secondary
failover lan interface folink GigabitEthernet0/7
failover interface ip folink 172.27.48.1 255.255.255.0 standby 172.27.48.2
```

## Health and Status Information

To see the general health of the ASA 5500-X IPS SSP, use the **show module ips details** command.

```
asa# show module ips details
Getting details from the Service Module, please wait...

Card Type:          IPS 5555 Intrusion Prevention System
Model:              IPS5555
Hardware version:   N/A
Serial Number:      FCH1504V0CW
Firmware version:   N/A
Software version:   7.1(3)E4
MAC Address Range:  503d.e59c.7ca0 to 503d.e59c.7ca0
App. name:          IPS
App. Status:        Up
App. Status Desc:   Normal Operation
App. version:       7.1(3)E4
Data Plane Status:  Up
Status:             Up
License:            IPS Module  Enabled  perpetual
Mgmt IP addr:       192.168.1.2
Mgmt Network mask:  255.255.255.0
Mgmt Gateway:       192.168.1.1
Mgmt web ports:     443
Mgmt TLS enabled:   true
asa#
```

The output shows that the ASA 5500-X IPS SSP is up. If the status reads `Down`, you can reset it using the **sw-module module 1 reset** command.

If you have problems with reimaging the ASA 5500-X IPS SSP, use the **debug module-boot** command to see the output as it boots. Make sure you have the correct IP address for the TFTP server and you have the correct file on the TFTP server. Then use the **sw-module module ips recover** command again to reimage the module.

```
asa-ips# sw-module module ips recover configure image
disk0:/IPS-SSP_5555-K9-sys-1.1-a-7.1-3-E4.aip
Image URL [tftp://192.0.2.1/IPS-5545-K9-sys-1.1-a-7.1-3-E4.aip]:
Port IP Address [192.0.2.226]:
VLAN ID [0]:
Gateway IP Address [192.0.2.254]:

asa-ips# debug module-boot
debug module-boot enabled at level 1
asa-ips# sw-module module ips reload

Reload module ips? [confirm]
Reload issued for module ips.
asa-ips# Mod-ips 228> ***
Mod-ips 229> *** EVENT: The module is reloading.
Mod-ips 230> *** TIME: 08:07:36 CST Jan 17 2012
Mod-ips 231> ***
Mod-ips 232> Mod-ips 233> The system is going down NOW!
Mod-ips 234> Sending SIGTERM to all processes
Mod-ips 235> Sending SIGKILL to all processes
Mod-ips 236> Requesting system reboot
Mod-ips 237> e1000 0000:00:07.0: PCI INT A disabled
Mod-ips 238> e1000 0000:00:06.0: PCI INT A disabled
Mod-ips 239> e1000 0000:00:05.0: PCI INT A disabled
Mod-ips 240> Restarting system.
Mod-ips 241> machine restart
Mod-ips 242> IVSHMEM: addr = 4093640704 size = 67108864
Mod-ips 243>   Booting 'Cisco IPS'
Mod-ips 244> root (hd0,0)
Mod-ips 245> Filesystem type is ext2fs, partition type 0x83
Mod-ips 246> kernel /ips-2.6.1d ro initfsDev=/dev/hda1 init=loader.run rootrw=/dev/hda2
init
Mod-ips 247> fs=runtime-image.cpio.bz2 hda=nodma console=ttyS0 plat=saleen htlblow=1
hugepag
Mod-ips 248> es=3223
Mod-ips 249>    [Linux-bzImage, setup=0x2c00, size=0x2bad80]
Mod-ips 250> Linux version 2.6.29.1 (ipsbuild@seti-teambuilder-a) (gcc version 4.3.2
(crosstool
Mod-ips 251> -NG-1.4.1) ) #56 SMP Tue Dec 6 00:46:11 CST 2011
Mod-ips 252> Command line: ro initfsDev=/dev/hda1 init=loader.run rootrw=/dev/hda2
initfs=runti
Mod-ips 253> me-image.cpio.bz2 hda=nodma console=ttyS0 plat=saleen htlblow=1
hugepages=3223
--MORE--
```

# The ASA 5500-X IPS SSP and the Normalizer Engine

The majority of the features in the Normalizer engine are not used on the ASA 5500-X IPS SSP, because the ASA itself handles the normalization. Packets on the ASA IPS modules go through a special path in the Normalizer that only reassembles fragments and puts packets in the right order for the TCP stream. The Normalizer does not do any of the normalization that is done on an inline IPS appliance, because that causes problems in the way the ASA handles the packets.

The following Normalizer engine signatures are not supported:

- 1300.0
- 1304.0
- 1305.0

- 1307.0
- 1308.0
- 1309.0
- 1311.0
- 1315.0
- 1316.0
- 1317.0
- 1330.0
- 1330.1
- 1330.2
- 1330.9
- 1330.10
- 1330.12
- 1330.14
- 1330.15
- 1330.16
- 1330.17
- 1330.18

#### For More Information

For detailed information about the Normalizer engine, see Normalizer Engine.

# The ASA 5500-X IPS SSP and Memory Usage

For the ASA 5500-X IPS SSP, the memory usage is 93%. The default health thresholds for the sensor are 80% for yellow and 91% for red, so the sensor health will be shown as red on these platforms even for normal operating conditions. You can tune the threshold percentage for memory usage so that it reads more accurately for these platforms by configuring the Memory Usage option in IDM or IME, and the **memory-usage-policy** command in the CLI in the sensor health metrics.

**Note** Make sure you have the Memory Usage (IDM/IME)/**memory-usage-policy** (CLI) option in the sensor health metrics enabled.

Table E-3 lists the Yellow Threshold and Red Threshold health values.

*Table E-3 ASA 5500-X IPS SSP Memory Usage Values*

| Platform | Yellow | Red | Memory Used |
|---|---|---|---|
| ASA 5512-X IPS SSP | 85% | 91% | 28% |
| ASA 5515-X IPS SSP | 88% | 92% | 14% |
| ASA 5525-X IPS SSP | 88% | 92% | 14% |

*Table E-3 ASA 5500-X IPS SSP Memory Usage Values*

| Platform | Yellow | Red | Memory Used |
|---|---|---|---|
| ASA 5545-X IPS SSP | 93% | 96% | 13% |
| ASA 5555-X IPS SSP | 95% | 98% | 17% |

# The ASA 5500-X IPS SSP and Jumbo Packet Frame Size

Refer to the following URL for information about ASA 5500-X IPS SSP jumbo packet frame size:

http://www.cisco.com/en/US/docs/security/asa/asa84/configuration/guide/interface_start.html#wp1328869

**Note** A jumbo frame is an Ethernet packet that is larger than the standard maximum of 1518 bytes (including Layer 2 header and FCS).

# The ASA 5500-X IPS SSP and Jumbo Packets

The jumbo packet count in the **show interface** command output from the lines `Total Jumbo Packets Received` and `Total Jumbo Packets Transmitted` for ASA IPS modules may be larger than expected due to some packets that were almost jumbo size on the wire being counted as jumbo size by the IPS. This miscount is a result of header bytes added to the packet by the ASA before the packet is transmitted to the IPS. For IPv4, 58 bytes of header data are added. For IPv6, 78 bytes of header data are added. The ASA removes the added IPS header before the packet leaves the ASA.

# TCP Reset Differences Between IPS Appliances and ASA IPS Modules

The IPS appliance sends TCP reset packets to both the attacker and victim when Reset TCP Connection is selected. The IPS appliance sends a TCP reset packet only to the victim under the following circumstances:

- When a Deny Packet Inline or Deny Connection Inline is selected
- When TCP-based signatures and Reset TCP Connection have NOT been selected

In the case of the ASA IPS module, the TCP reset request is sent to the ASA, and the ASA then sends the TCP reset packets. The ASA sends TCP reset packets to both the attacker and victim when the Reset TCP Connection is selected. When Deny Packet Inline or Deny Connection Inline is selected, the ASA sends the TCP reset packet to either the attacker or victim depending on the configuration of the signature. Signatures configured to swap the attacker and victim when reporting the alert can cause the ASA to send the TCP reset packet to the attacker.

### For More Information

For detailed information about event actions, refer to Event Actions.

## IPS Reloading Messages

**Symptom** ASA syslog messages similar to the following are observed and the root cause of the message is not clear:

```
%ASA-1-505013: ASA-SSM-10 Module in slot 1, application reloading "IPS", version
"7.1(6)E4" Config Change
%ASA-1-505013: ASA5585-SSP-IPS10 Module in slot 1, application reloading "IPS", version
"7.1(1)E4" Config Change
```

These messages occur once an hour for sensors not actively being configured or more often for sensors being configured.

**Conditions** ASA adaptive appliances running an affected software version with an ASA IPS module (ASA 5500 AIP SSMASA 5500-X IPS SSPASA 5585-X IPS SSP) installed that is running IPS 7.1 or later. The common cause for these messages is global correlation and/or signature updates occurring on the ASA IPS module that results in these messages being generated for some, but not necessarily all of the updates, which are attempted every five minutes.

**Workaround** None. The cause of these messages can be confirmed on the sensor module by reviewing the **show events status** *past* command output and identifying a status event that corresponds to the ASA syslog message that matches the date and time. The sensor's status event should provide further details about what operation occurred that resulted in the ASA syslog message.

## IPS Not Loading

**Symptom** For a failing unit, the Mod Card Type shows `ips Unknown`:

`CMGR PLAT: In sw_mod_idprom_resp_handler Failed to find idp resp udi pdesc for slot 1` messages are seen on the ASA console.

The mac address contains either `da` or `cb` (hex values).

**Conditions** Loading the IPS image on ASA 5500-X platforms.

**Workaround** The IPS 7.1(8) p1E4 patch fixes this problem.

# Troubleshooting the ASA 5585-X IPS SSP

**Tip** Before troubleshooting the ASA 5585-X IPS SSP, check the Caveats section of the Readme for the software version installed on your sensor to see if you are dealing with a known issue.

This section contains troubleshooting information specific to the ASA 5585-X IPS SSP, and contains the following topics:


- Failover Scenarios, page E-71
- Traffic Flow Stopped on IPS Switchports, page E-72
- Health and Status Information, page E-72

- The ASA 5585-X IPS SSP and the Normalizer Engine, page E-75
- The ASA 5585-X IPS SSP and Jumbo Packet Frame Size, page E-76
- The ASA 5585-X IPS SSP and Jumbo Packets, page E-76
- IPS Reloading Messages, page E-77

# Failover Scenarios

The following failover scenarios apply to the ASA 5585-X in the event of configuration changes, signature/signature engine updates, service packs, and SensorApp crashes on the ASA 5585-X IPS SSP.

### Single ASA 5585-X in Fail-Open Mode

- If the ASA is configured in fail-open mode for the ASA 5585-X IPS SSP, and the ASA 5585-X IPS SSP experiences a configuration change or signature/signature engine update, traffic is passed through the ASA without being inspected.
- If the ASA is configured in fail-open mode for the ASA 5585-X IPS SSP, and the ASA 5585-X IPS SSP experiences a SensorApp crash or a service pack upgrade, traffic is passed through the ASA without being inspected.

### Single ASA 5585-X in Fail-Close Mode

- If the ASA is configured in fail-close mode for the ASA 5585-X IPS SSP, and the ASA 5585-X IPS SSP experiences a configuration change or a signature/signature engine update, traffic is stopped from passing through the ASA.
- If the ASA is configured in fail-close mode for the ASA 5585-X IPS SSP, and the ASA 5585-X IPS SSP experiences a SensorApp crash or a service pack upgrade, traffic is stopped from passing through the ASA.

### Two ASA 5585-Xs in Fail-Open Mode

- If the ASAs are configured in fail-open mode and if the ASA 5585-X IPS SSP on the active ASA experiences a configuration change or a signature/signature engine update, traffic is still passed through the active ASA without being inspected. Failover is not triggered.
- If the ASAs are configured in fail-open mode, and if the ASA 5585-X IPS SSP on the active ASA experiences a SensorApp crash or a service pack upgrade, failover is triggered and traffic passes through the ASA 5585-X IPS SSP that was previously the standby ASA 5585-X IPS SSP.

### Two ASA 5585-Xs in Fail-Close Mode

- If the ASAs are configured in fail-close mode, and if the ASA 5585-X IPS SSP on the active ASA experiences a configuration change or a signature/signature engine update, traffic is stopped from passing through the active ASA. No failover is triggered.
- If the ASAs are configured in fail-close mode, and if the ASA 5585-X IPS SSP on the active ASA experiences a SensorApp crash or a service pack upgrade, failover is triggered and traffic passes through the ASA 5585-X IPS SSP that was previously the standby for the ASA 5585-X IPS SSP.

### Configuration Examples

Use the following configuration for the primary ASA:

```
interface GigabitEthernet0/7
 description LAN Failover Interface

failover
```

```
failover lan unit primary
failover lan interface folink GigabitEthernet0/7
failover interface ip folink 172.27.48.1 255.255.255.0 standby 172.27.48.2
```

Use the following configuration for the secondary ASA:

```
interface GigabitEthernet0/7
 description LAN Failover Interface

failover
failover lan unit secondary
failover lan interface folink GigabitEthernet0/7
failover interface ip folink 172.27.48.1 255.255.255.0 standby 172.27.48.2
```

# Traffic Flow Stopped on IPS Switchports

**Problem** Traffic on any port located on the ASA 5585-X IPS SSP (1/x) no longer passes through the adaptive security appliance when the ASA 5585-X IPS SSP is reset or shut down. This affects all traffic through these ports regardless of whether or not the traffic would have been monitored by the IPS. The link on the ports will link down when the ASA 5585-X IPS SSP is reset or shut down.

**Possible Cause** Using the ports located on the ASA 5585-X IPS SSP (1/x), and resetting or shutting it down via any mechanism.

**Solution** Use the ports on the adaptive security appliance (0/x) instead because those ports do not lose their link when the ASA 5585-X IPS SSP is reset or shut down.

# Health and Status Information

To see the general health of the ASA 5585-X IPS SSP, use the **show module 1 details** command.

```
asa# show module 1 details
Getting details from the Service Module, please wait...
ASA 5585-X IPS Security Services Processor-20 with 8GE
Model:              ASA5585-SSP-IPS20
Hardware version:   1.0
Serial Number:      ABC1234DEFG
Firmware version:   2.0(1)3
Software version:   7.1(1)E4
MAC Address Range:  8843.e12f.5414 to 8843.e12f.541f
App. name:          IPS
App. Status:        Up
App. Status Desc:   Normal Operation
App. version:       7.1(1)E4
Data plane Status:  Up
Status:             Up
Mgmt IP addr:       192.0.2.3
Mgmt Network mask:  255.255.255.0
Mgmt Gateway:       192.0.2.254
Mgmt Access List:   10.0.0.0/8
Mgmt Access List:   64.0.0.0/8
Mgmt web ports:     443
Mgmt TLS enabled    true
asa
```

The output shows that the ASA 5585-X IPS SSP is up. If the status reads `Down`, you can reset it using the **hw-module module 1 reset** command.

```
asa# hw-module module 1 reset
```

```
The module in slot 1 should be shut down before
resetting it or loss of configuration may occur.
Reset module in slot 1? [confirm]
Reset issued for module in slot 1
asa# show module 1 details
Getting details from the Service Module, please wait...
Unable to read details from slot 1
ASA 5585-X IPS Security Services Processor-20 with 8GE
Model:              ASA5585-SSP-IPS20
Hardware version:   1.0
Serial Number:      ABC1234DEFG
Firmware version:   2.0(7)0
Software version:   7.1(1)E4
MAC Address Range:  5475.d029.7f9c to 5475.d029.7fa7
App. name:          IPS
App. Status:        Not Applicable
App. Status Desc:   Not Applicable
App. version:       7.1(1)E4
Data plane Status:  Not Applicable
Status:             Shutting Down
asa# show module 1 details
Getting details from the Service Module, please wait...
Unable to read details from slot 1
ASA 5585-X IPS Security Services Processor-20 with 8GE
Model:              ASA5585-SSP-IPS20
Hardware version:   1.0
Serial Number:      ABC1234DEFG
Firmware version:   2.0(7)0
Software version:   7.1(1)E4
MAC Address Range:  5475.d029.7f9c to 5475.d029.7fa7
App. name:          IPS
App. Status:        Not Applicable
App. Status Desc:   Not Applicable
App. version:       7.1(1)E4
Data plane Status:  Not Applicable
Status:             Down
asa# show module 1 details
Getting details from the Service Module, please wait...
Unable to read details from slot 1
ASA 5585-X IPS Security Services Processor-20 with 8GE
Model:              ASA5585-SSP-IPS20
Hardware version:   1.0
Serial Number:      ABC1234DEFG
Firmware version:   2.0(7)0
Software version:   7.1(1)E4
MAC Address Range:  5475.d029.7f9c to 5475.d029.7fa7
App. name:          IPS
App. Status:        Not Applicable
App. Status Desc:   Not Applicable
App. version:       7.1(1)E4
Data plane Status:  Not Applicable
Status:             Init
asa# show module 1 details
Getting details from the Service Module, please wait...
ASA 5585-X IPS Security Services Processor-20 with 8GE
Model:              ASA5585-SSP-IPS20
Hardware version:   1.0
Serial Number:      ABC1234DEFG
Firmware version:   2.0(7)0
Software version:   7.1(1)E4
MAC Address Range:  5475.d029.7f9c to 5475.d029.7fa7
App. name:          IPS
App. Status:        Reload
App. Status Desc:   Starting up
```

```
App. version:       7.1(1)E4
Data plane Status:  Down
Status:             Up
Mgmt IP addr:       192.0.2.3
Mgmt Network mask:  255.255.255.0
Mgmt Gateway:       192.0.2.254
Mgmt Access List:   0.0.0.0/0
Mgmt web ports:     443
Mgmt TLS enabled:   true
asa# show module 1 details
Getting details from the Service Module, please wait...
ASA 5585-X IPS Security Services Processor-20 with 8GE
Model:              ASA5585-SSP-IPS20
Hardware version:   1.0
Serial Number:      ABC1234DEFG
Firmware version:   2.0(7)0
Software version:   7.1(1)E4
MAC Address Range:  5475.d029.7f9c to 5475.d029.7fa7
App. name:          IPS
App. Status:        Up
App. Status Desc:   Normal Operation
App. version:       7.1(1)E4
Data plane Status:  Up
Status:             Up
Mgmt IP addr:       192.0.2.3
Mgmt Network mask:  255.255.255.0
Mgmt Gateway:       192.0.2.254
Mgmt Access List:   0.0.0.0/0
Mgmt web ports:     443
Mgmt TLS enabled:   true
asa#
```

If you have problems with reimaging the ASA 5585-X IPS SSP, use the **debug module-boot** command to see the output as it boots. Make sure you have the correct IP address for the TFTP server and you have the correct file on the TFTP server. Then use the **hw-module module 1 recover** command again to reimage the module.

```
ips-ssp# hw-module module 1 recover configure
Image URL [tftp://0.0.0.0/]: tftp://10.10.10.10//IPS-SSP_20-K9-sys-1.1-a-7.1-1-E4.img
Port IP Address [0.0.0.0]: 10.10.10.11
VLAN ID [0]:
Gateway IP Address [0.0.0.0]: 10.10.10.254

asa(config)# debug module-boot
debug module-boot enabled at level 1
asa(config)# hw-module module 1 recover boot
The module in slot 1 will be recovered. This may erase all configuration and all data on
that device and attempt to download a new image for it.
Recover module in slot 1? [confirm]
Recover issued for module in slot 1
asa(config)# Slot-1 140> Cisco Systems ROMMON Version (1.0(10)0) #0: Fri Mar 25 23:02:10
PST 2010
Slot-1 141> Platform ASA5585-SSP-IPS20
Slot-1 142> GigabitEthernet0/0
Slot-1 143> Link is UP
Slot-1 144> MAC Address: 000b.fcf8.0176
Slot-1 145> ROMMON Variable Settings:
Slot-1 146>   ADDRESS=192.0.2.3
Slot-1 147>   SERVER=192.0.2.15
Slot-1 148>   GATEWAY=192.0.2.254
Slot-1 149>   PORT=GigabitEthernet0/0
Slot-1 150>   VLAN=untagged
Slot-1 151>   IMAGE=IPS-SSP-K9-sys-1.1-a-7.1-0.1.img
```

```
Slot-1 152>   CONFIG=
Slot-1 153>   LINKTIMEOUT=20
Slot-1 154>   PKTTIMEOUT=4
Slot-1 155>   RETRY=20
Slot-1 156> tftp IPS-SSP_10-K9-sys-1.1-a-7.1-0.1.img@192.0.2.15 via 192.0.2.254
Slot-1 157> TFTP failure: Packet verify failed after 20 retries
Slot-1 158> Rebooting due to Autoboot error ...
Slot-1 159> Rebooting....
Slot-1 160> Cisco Systems ROMMON Version (1.0(10)0) #0: Fri Mar 25 23:02:10 PST 2010
Slot-1 161> Platform ASA5585-SSP-IPS20
Slot-1 162> GigabitEthernet0/0
Slot-1 163> Link is UP
Slot-1 164> MAC Address: 000b.fcf8.0176
Slot-1 165> ROMMON Variable Settings:
Slot-1 166>   ADDRESS=192.0.2.3
Slot-1 167>   SERVER=192.0.2.15
Slot-1 168>   GATEWAY=192.0.2.254
Slot-1 169>   PORT=GigabitEthernet0/0
Slot-1 170>   VLAN=untagged
Slot-1 171>   IMAGE=IPS-SSP_10-K9-sys-1.1-a-7.1-0.1.img
Slot-1 172>   CONFIG=
Slot-1 173>   LINKTIMEOUT=20
Slot-1 174>   PKTTIMEOUT=4
Slot-1 175>   RETRY=20
Slot-1 176> tftp IPS-SSP_10-K9-sys-1.1-a-7.1-0.1.img@192.0.2.15 via 192.0.2.254
```

# The ASA 5585-X IPS SSP and the Normalizer Engine

The majority of the features in the Normalizer engine are not used on the ASA 5585-X IPS SSP, because the ASA itself handles the normalization. Packets on the ASA IPS modules go through a special path in the Normalizer that only reassembles fragments and puts packets in the right order for the TCP stream. The Normalizer does not do any of the normalization that is done on an inline IPS appliance, because that causes problems in the way the ASA handles the packets.

The following Normalizer engine signatures are not supported:

- 1300.0
- 1304.0
- 1305.0
- 1307.0
- 1308.0
- 1309.0
- 1311.0
- 1315.0
- 1316.0
- 1317.0
- 1330.0
- 1330.1
- 1330.2
- 1330.9
- 1330.10

- 1330.12
- 1330.14
- 1330.15
- 1330.16
- 1330.17
- 1330.18

#### For More Information

For detailed information about the Normalizer engine, see Normalizer Engine.

# The ASA 5585-X IPS SSP and Jumbo Packet Frame Size

Refer to the following URL for information about ASA 5585-X IPS SSP jumbo packet frame size:

http://www.cisco.com/en/US/docs/security/asa/asa84/configuration/guide/interface_start.html#wp1328869

**Note** A jumbo frame is an Ethernet packet that is larger than the standard maximum of 1518 bytes (including Layer 2 header and FCS).

# The ASA 5585-X IPS SSP and Jumbo Packets

The jumbo packet count in the **show interface** command output from the lines `Total Jumbo Packets Received` and `Total Jumbo Packets Transmitted` for ASA IPS modules may be larger than expected due to some packets that were almost jumbo size on the wire being counted as jumbo size by the IPS. This miscount is a result of header bytes added to the packet by the ASA before the packet is transmitted to the IPS. For IPv4, 58 bytes of header data are added. For IPv6, 78 bytes of header data are added. The ASA removes the added IPS header before the packet leaves the ASA.

#### TCP Reset Differences Between IPS Appliances and ASA IPS Modules

The IPS appliance sends TCP reset packets to both the attacker and victim when Reset TCP Connection is selected. The IPS appliance sends a TCP reset packet only to the victim under the following circumstances:

- When a Deny Packet Inline or Deny Connection Inline is selected
- When TCP-based signatures and Reset TCP Connection have NOT been selected

In the case of the ASA IPS module, the TCP reset request is sent to the ASA, and the ASA then sends the TCP reset packets. The ASA sends TCP reset packets to both the attacker and victim when the Reset TCP Connection is selected. When Deny Packet Inline or Deny Connection Inline is selected, the ASA sends the TCP reset packet to either the attacker or victim depending on the configuration of the signature. Signatures configured to swap the attacker and victim when reporting the alert can cause the ASA to send the TCP reset packet to the attacker.

#### For More Information

For detailed information about event actions, refer to Event Actions.

## IPS Reloading Messages

**Symptom** ASA syslog messages similar to the following are observed and the root cause of the message is not clear:

```
%ASA-1-505013: ASA-SSM-10 Module in slot 1, application reloading "IPS", version
"7.1(6)E4" Config Change
%ASA-1-505013: ASA5585-SSP-IPS10 Module in slot 1, application reloading "IPS", version
"7.1(1)E4" Config Change
```

These messages occur once an hour for sensors not actively being configured or more often for sensors being configured.

**Conditions** ASA adaptive appliances running an affected software version with an ASA IPS module (ASA 5500 AIP SSMASA 5500-X IPS SSPASA 5585-X IPS SSP) installed that is running IPS 7.1 or later. The common cause for these messages is global correlation and/or signature updates occurring on the ASA IPS module that results in these messages being generated for some, but not necessarily all of the updates, which are attempted every five minutes.

**Workaround** None. The cause of these messages can be confirmed on the sensor module by reviewing the **show events status** *past* command output and identifying a status event that corresponds to the ASA syslog message that matches the date and time. The sensor's status event should provide further details about what operation occurred that resulted in the ASA syslog message.

# Gathering Information

You can use the following CLI commands and scripts to gather information and diagnose the state of the sensor when problems occur. You can use the **show tech-support** command to gather all the information of the sensor, or you can use the other individual commands listed in this section for specific information.

This section contains the following topics:


- Health and Network Security Information, page E-77
- Tech Support Information, page E-78
- Version Information, page E-82
- Statistics Information, page E-85
- Interfaces Information, page E-97
- Events Information, page E-98
- cidDump Script, page E-102
- Uploading and Accessing Files on the Cisco FTP Site, page E-103


## Health and Network Security Information

**Caution** When the sensor is first starting, it is normal for certain health metric statuses to be red until the sensor is fully up and running.

**Note** The ASA 5500-X IPS SSP and the ASA 5585-X IPS SSP do not support bypass mode. The adaptive security appliance will either fail open, fail close, or fail over depending on the configuration of the adaptive security appliance and the type of activity being done on the IPS.

Use the **show health** command in privileged EXEC mode to display the overall health status information of the sensor. The health status categories are rated by red and green with red being critical.

To display the overall health status of the sensor, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Show the health and security status of the sensor.

```
sensor# show health
Overall Health Status                                 Red
Health Status for Failed Applications                 Green
Health Status for Signature Updates                   Green
Health Status for License Key Expiration              Red
Health Status for Running in Bypass Mode              Green
Health Status for Interfaces Being Down               Red
Health Status for the Inspection Load                 Green
Health Status for the Time Since Last Event Retrieval Green
Health Status for the Number of Missed Packets        Green
Health Status for the Memory Usage                    Not Enabled
Health Status for Global Correlation                  Red
Health Status for Network Participation               Not Enabled

Security Status for Virtual Sensor vs0   Green
sensor#
```

# Tech Support Information

The **show tech-support** command is useful for capturing all sensor status and configuration information. This section describes the **show tech-support** command, and contains the following topics:

- Understanding the show tech-support Command, page E-78
- Displaying Tech Support Information, page E-79
- Tech Support Command Output, page E-80

## Understanding the show tech-support Command

The **show tech-support** command captures all status and configuration information on the sensor and includes the current configuration, version information, and cidDump information. The output can be large, over 1 MB. You can transfer the output to a remote system. For the procedure for copying the output to a remote system, see Displaying Tech Support Information, page E-79.

**Note** Always run the **show tech-support** command before contacting TAC.

## Displaying Tech Support Information

**Note** The **show tech-support** command now displays historical interface data for each interface for the past 72 hours.

Use the **show tech-support** [**page**] [**destination-url** *destination_url*] command to display system information on the screen or have it sent to a specific URL. You can use the information as a troubleshooting tool with the TAC.

The following parameters are optional:

- **page**—Displays the output, one page of information at a time. Press **Enter** to display the next line of output or use the spacebar to display the next page of information.
- **destination-url**—Indicates the information should be formatted as HTML and sent to the destination that follows this command. If you use this keyword, the output is not displayed on the screen.
- *destination_url*—Indicates the information should be formatted as HTML.The URL specifies where the information should be sent. If you do not use this keyword, the information is displayed on the screen.
- You can specify the following destination types:
  - **ftp:**—Destination URL for FTP network server. The syntax for this prefix is:
    `ftp://[[username@location]/relativeDirectory]/filename` or
    `ftp://[[username@location]//absoluteDirectory]/filename`
  - **scp:**—Destination URL for the SCP network server. The syntax for this prefix is:
    `scp://[[username@]location]/relativeDirectory]/filename` or
    `scp://[[username@]location]//absoluteDirectory]/filename`

### Varlog Files

The /var/log/messages file has the latest logs. A new softlink called varlog has been created under the /usr/cids/idsRoot/log folder that points to the /var/log/messages file. Old logs are stored in varlog.1 and varlog.2 files. The maximum size of these varlog files is 200 KB. Once they cross the size limit the content is rotated. The content of varlog, varlog.1, and varlog.2 is displayed in the output of the **show tech-support** command.

### Displaying Tech Support Information

To display tech support information, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** View the output on the screen. The system information appears on the screen, one page at a time. Press the spacebar to view the next page or press **Ctrl-C** to return to the prompt

```
sensor# show tech-support page
```

**Step 3** To send the output (in HTML format) to a file:

**a.** Enter the following command, followed by a valid destination. The `password:` prompt appears.

```
sensor# show tech-support destination-url destination_url
```

Example

To send the tech support output to the file `/absolute/reports/sensor1Report.html`:

```
sensor# show tech support dest
ftp://csidsuser@10.2.1.2//absolute/reports/sensor1Report.html
```

**b.** Enter the password for this user account. The `Generating report:` message is displayed.

## Tech Support Command Output

**Note** This output example shows the first part of the command and lists the information for the interfaces, authentication, and the Analysis Engine.

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

The following is an example of the **show tech-support** command output:

```
sensor# show tech-support page
System Status Report
This Report was generated on Wed Nov 30 23:40:09 2011.
Output from show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
Serial Number:          123456789AB
No license present
Sensor up-time is 13 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.7M out of 171.6M bytes of available disk space (43%
 usage)
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96%
 usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CollaborationApp   S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CLI                S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600

Upgrade History:

  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4
```

```
Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013


Output from show interfaces
Interface Statistics
   Total Packets Received = 4285610
   Total Bytes Received = 548558080
   Missed Packet Percentage = 0
MAC statistics from interface Management0/0
   Interface function = Command-control interface
   Description =
   Media Type = TX
   Default Vlan = 0
   Link Status = Up
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 9584350
   Total Bytes Received = 986355666
   Total Multicast Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 7205444
   Total Bytes Transmitted = 1376470584
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
MAC statistics from interface PortChannel0/0
   Interface function = Sensing interface
   Description =
   Media Type = backplane
   Default Vlan = 0
   InlineMode = Unpaired
   Pair Status = N/A
   Hardware Bypass Capable = No
   Hardware Bypass Paired = N/A
   Link Status = Up
   Admin Enabled Status = Enabled
   Link Speed = Auto_10000
   Link Duplex = Auto_Full
   Missed Packet Percentage = 0
   Total Packets Received = 4285610
   Total Bytes Received = 548558080
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total requests for buffer when none available = 0
   Total Packets Transmitted = 4285610
   Total Bytes Transmitted = 548558080
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
MAC statistics from interface Management0/1
   Interface function = Reserved for future use

Output from show statistics authentication
General
   totalAuthenticationAttempts = 237
   failedAuthenticationAttempts = 14
```

```
Output from show statistics analysis-engine
Analysis Engine Statistics
   Number of seconds since service started = 1150851
   Processing Load Percentage
         Thread    5 sec   1 min   5 min
         0         1       1       1
         1         1       1       1
         2         1       1       1
         Average   1       1       1

   The rate of TCP connections tracked per second = 0
   The rate of packets per second = 0
   The rate of bytes per second = 0
   Receiver Statistics
      Total number of packets processed since reset = 0
      Total number of IP packets processed since reset = 0
   Transmitter Statistics
      Total number of packets transmitted = 4285631
      Total number of packets denied = 0
      Total number of packets reset = 0
   Fragment Reassembly Unit Statistics
      Number of fragments currently in FRU = 0
      Number of datagrams currently in FRU = 0
   TCP Stream Reassembly Unit Statistics
      TCP streams currently in the embryonic state = 0
      TCP streams currently in the established state = 0
      TCP streams currently in the closing state = 0
      TCP streams currently in the system = 0
      TCP Packets currently queued for reassembly = 0
   The Signature Database Statistics.
      Total nodes active = 0
      TCP nodes keyed on both IP addresses and both ports = 0
      UDP nodes keyed on both IP addresses and both ports = 0
      IP nodes keyed on both IP addresses = 0
   Statistics for Signature Events
      Number of SigEvents since reset = 0
   Statistics for Actions executed on a SigEvent
      Number of Alerts written to the IdsEventStore = 0
   Inspection Stats

--MORE--
```

# Version Information

The **show version** command is useful for obtaining sensor information. This section describes the **show version** command, and contains the following topics:

- Understanding the show version Command, page E-82
- Displaying Version Information, page E-83

## Understanding the show version Command

The **show version** command shows the basic sensor information and can indicate where a failure is occurring. It gives the following information:

- Which applications are running
- Versions of the applications

- Disk and memory usage
- Upgrade history of the applications

**Note** To get the same information from IDM, choose **Monitoring > Sensor Monitoring > Support Information > Diagnostics Report.** To get the same information from IME, choose **Configuration >** *sensor_name* **> Sensor Monitoring > Support Information > Diagnostics Report.**

## Displaying Version Information

Use the **show version** command to display version information for all installed operating system packages, signature packages, and IPS processes running on the system. To view the configuration for the entire system, use the **more current-config** command.

**Note** The CLI output is an example of what your configuration may look like. It will not match exactly due to the optional setup choices, sensor model, and IPS 7.1 version you have installed.

To display the version and configuration, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** View version information.

```
sensor# show version
Application Partition:

Cisco Intrusion Prevention System, Version 7.1(3)E4

Host:
    Realm Keys          key1.0
Signature Definition:
    Signature Update    S605.0              2011-10-25
OS Version:             2.6.29.1
Platform:               ASA5585-SSP-IPS10
Serial Number:          123456789AB
No license present
Sensor up-time is 13 days.
Using 4395M out of 5839M bytes of available memory (75% usage)
system is using 26.2M out of 160.0M bytes of available disk space (16% usage)
application-data is using 69.7M out of 171.6M bytes of available disk space (43%
 usage)
boot is using 57.3M out of 70.5M bytes of available disk space (86% usage)
application-log is using 494.0M out of 513.0M bytes of available disk space (96%
 usage)


MainApp            S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
AnalysisEngine     S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CollaborationApp   S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600   Running
CLI                S-2011_NOV_16_00_20_7_1_3_46   (Release)   2011-11-16T00:23:0
6-0600

Upgrade History:
```

```
  IPS-K9-7.1-3-E4   00:30:07 UTC Wed Nov 16 2011

Recovery Partition Version 1.1 - 7.1(3)E4

Host Certificate Valid from: 16-Nov-2011 to 16-Nov-2013

sensor#
```

**Note** If the --MORE-- prompt is displayed, press the spacebar to see more information or **Ctrl-C** to cancel the output and get back to the CLI prompt.

**Step 3** View configuration information.

**Note** You can use the **more current-config** or **show configuration** commands.

```
sensor# more current-config
! ------------------------------
! Current configuration last modified Tue Nov 22 16:11:35 2011
! ------------------------------
! Version 7.1(3)
! Host:
!     Realm Keys          key1.0
! Signature Definition:
!     Signature Update    S605.0   2011-10-25
! ------------------------------
service interface
exit
! ------------------------------
service authentication
exit
! ------------------------------
service event-action-rules rules0
exit
! ------------------------------
service host
network-settings
host-ip 192.168.1.2/24, 192.168.1.1
host-name sensor
telnet-option enabled
access-list 0.0.0.0/0
dns-primary-server disabled
exit
exit
! ------------------------------
service logger
exit
! ------------------------------
service network-access
exit
! ------------------------------
service notification
exit
! ------------------------------
service signature-definition sig0
exit
! ------------------------------
service ssh-known-hosts
exit
! ------------------------------
service trusted-certificates
```

```
exit
! ------------------------------
service web-server
exit
! ------------------------------
service anomaly-detection ad0
exit
! ------------------------------
service external-product-interface
exit
! ------------------------------
service health-monitor
exit
! ------------------------------
service global-correlation
exit
! ------------------------------
service aaa
exit
! ------------------------------
service analysis-engine
sensor#
```

# Statistics Information

The **show statistics** command is useful for examining the state of the sensor services. This section describes the **show statistics** command, and contains the following topics:


- Understanding the show statistics Command, page E-85
- Displaying Statistics, page E-86


## Understanding the show statistics Command

The **show statistics** command provides a snapshot of the state of the sensor services. The following services provide statistics:

- AnalysisEngine
- Authentication
- Denied Attackers
- Event Server
- Event Store
- Host
- Logger
- Attack Response (formerly known as Network Access)
- Notification
- SDEE Server
- Transaction Server
- Transaction Source

- Virtual Sensor
- Web Server

**Note** To get the same information from IDM, choose **Monitoring > Sensor Monitoring > Support Information > Statistics.** To get the same information from IME, choose **Configuration >** *sensor_name* **> Sensor Monitoring > Support Information >Statistics**.

## Displaying Statistics

Use the **show statistics [analysis-engine | anomaly-detection | authentication | denied-attackers | event-server | event-store | external-product-interface | global-correlation | host | logger | network-access | notification | os-identification | sdee-server | transaction-server | virtual-sensor | web-server**] [**clear**] command to display statistics for each sensor application.

Use the **show statistics** {**anomaly-detection | denied-attackers | os-identification | virtual-sensor**} [***name*** **| clear**] command to display statistics for these components for all virtual sensors. If you provide the virtual sensor name, the statistics for that virtual sensor only are displayed.

**Note** The **clear** option is not available for the analysis engine, anomaly detection, host, network access, or OS identification applications.

To display statistics for the sensor, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Display the statistics for the Analysis Engine.

```
sensor# show statistics analysis-engine
Analysis Engine Statistics
   Number of seconds since service started = 431157
   Processing Load Percentage
         Thread    5 sec   1 min   5 min
         0         1       1       1
         1         1       1       1
         2         1       1       1
         3         1       1       1
         4         1       1       1
         5         1       1       1
         6         1       1       1
         Average   1       1       1

   The rate of TCP connections tracked per second = 0
   The rate of packets per second = 0
   The rate of bytes per second = 0
   Receiver Statistics
      Total number of packets processed since reset = 0
      Total number of IP packets processed since reset = 0
   Transmitter Statistics
      Total number of packets transmitted = 133698
      Total number of packets denied = 203
      Total number of packets reset = 3
   Fragment Reassembly Unit Statistics
      Number of fragments currently in FRU = 0
      Number of datagrams currently in FRU = 0
   TCP Stream Reassembly Unit Statistics
      TCP streams currently in the embryonic state = 0
```

```
   TCP streams currently in the established state = 0
   TCP streams currently in the closing state = 0
   TCP streams currently in the system = 0
   TCP Packets currently queued for reassembly = 0
The Signature Database Statistics.
   Total nodes active = 0
   TCP nodes keyed on both IP addresses and both ports = 0
   UDP nodes keyed on both IP addresses and both ports = 0
   IP nodes keyed on both IP addresses = 0
Statistics for Signature Events
   Number of SigEvents since reset = 0
Statistics for Actions executed on a SigEvent
   Number of Alerts written to the IdsEventStore = 0
Inspection Stats
      Inspector            active   call   create   delete   loadPct
      AtomicAdvanced       0        2312   4        4        33
      Fixed                0        1659   1606     1606     1
      MSRPC_TCP            0        20     4        4        0
      MSRPC_UDP            0        1808   1575     1575     0
      MultiString          0        145    10       10       2
      ServiceDnsUdp        0        1841   3        3        0
      ServiceGeneric       0        2016   14       14       1
      ServiceHttp          0        2      2        2        51
      ServiceNtp           0        3682   3176     3176     0
      ServiceP2PTCP        0        21     9        9        0
      ServiceRpcUDP        0        1841   3        3        0
      ServiceRpcTCP        0        130    9        9        0
      ServiceSMBAdvanced   0        139    3        3        0
      ServiceSnmp          0        1841   3        3        0
      ServiceTNS           0        18     14       14       0
      String               0        225    16       16       0
      SweepUDP             0        1808   1555     1555     6
      SweepTCP             0        576    17       17       0
      SweepOtherTcp        0        288    6        6        0
      TrojanBO2K           0        261    11       11       0
      TrojanUdp            0        1808   1555     1555     0

GlobalCorrelationStats
   SwVersion = 7.1(4.70)E4
   SigVersion = 645.0
   DatabaseRecordCount = 0
   DatabaseVersion = 0
   RuleVersion = 0
   ReputationFilterVersion = 0
   AlertsWithHit = 0
   AlertsWithMiss = 0
   AlertsWithModifiedRiskRating = 0
   AlertsWithGlobalCorrelationDenyAttacker = 0
   AlertsWithGlobalCorrelationDenyPacket = 0
   AlertsWithGlobalCorrelationOtherAction = 0
   AlertsWithAuditRepDenies = 0
   ReputationForcedAlerts = 0
   EventStoreInsertTotal = 0
   EventStoreInsertWithHit = 0
   EventStoreInsertWithMiss = 0
   EventStoreDenyFromGlobalCorrelation = 0
   EventStoreDenyFromOverride = 0
   EventStoreDenyFromOverlap = 0
   EventStoreDenyFromOther = 0
   ReputationFilterDataSize = 0
   ReputationFilterPacketsInput = 0
   ReputationFilterRuleMatch = 0
   DenyFilterHitsNormal = 0
   DenyFilterHitsGlobalCorrelation = 0
```

```
      SimulatedReputationFilterPacketsInput = 0
      SimulatedReputationFilterRuleMatch = 0
      SimulatedDenyFilterInsert = 0
      SimulatedDenyFilterPacketsInput = 0
      SimulatedDenyFilterRuleMatch = 0
      TcpDeniesDueToGlobalCorrelation = 0
      TcpDeniesDueToOverride = 0
      TcpDeniesDueToOverlap = 0
      TcpDeniesDueToOther = 0
      SimulatedTcpDeniesDueToGlobalCorrelation = 0
      SimulatedTcpDeniesDueToOverride = 0
      SimulatedTcpDeniesDueToOverlap = 0
      SimulatedTcpDeniesDueToOther = 0
      LateStageDenyDueToGlobalCorrelation = 0
      LateStageDenyDueToOverride = 0
      LateStageDenyDueToOverlap = 0
      LateStageDenyDueToOther = 0
      SimulatedLateStageDenyDueToGlobalCorrelation = 0
      SimulatedLateStageDenyDueToOverride = 0
      SimulatedLateStageDenyDueToOverlap = 0
      SimulatedLateStageDenyDueToOther = 0
      AlertHistogram
      RiskHistogramEarlyStage
      RiskHistogramLateStage
      ConfigAggressiveMode = 0
      ConfigAuditMode = 0
   RegexAccelerationStats
      Status = Enabled
      DriverVersion = 6.2.1
      Devices = 1
      Agents = 12
      Flows = 7
      Channels = 0
      SubmittedJobs = 4968
      CompletedJobs = 4968
      SubmittedBytes = 72258005
      CompletedBytes = 168
      TCPFlowsWithoutLCB = 0
      UDPFlowsWithoutLCB = 0
      TCPMissedPacketsDueToUpdate = 0
      UDPMissedPacketsDueToUpdate = 0
      MemorySize = 1073741824
      HostDirectMemSize = 0
   MaliciousSiteDenyHitCounts
   MaliciousSiteDenyHitCountsAUDIT
sensor#
```

**Step 3** Display the statistics for anomaly detection.

```
sensor# show statistics anomaly-detection
Statistics for Virtual Sensor vs0
   No attack
   Detection - ON
   Learning - ON
   Next KB rotation at 10:00:01 UTC Sat Jan 18 2008
   Internal Zone
      TCP Protocol
      UDP Protocol
      Other Protocol
   External Zone
      TCP Protocol
      UDP Protocol
      Other Protocol
   Illegal Zone
```

```
      TCP Protocol
      UDP Protocol
      Other Protocol
Statistics for Virtual Sensor vs1
   No attack
   Detection - ON
   Learning - ON
   Next KB rotation at 10:00:00 UTC Sat Jan 18 2008
   Internal Zone
      TCP Protocol
      UDP Protocol
      Other Protocol
   External Zone
      TCP Protocol
      UDP Protocol
      Other Protocol
   Illegal Zone
      TCP Protocol
      UDP Protocol
      Other Protocol
sensor#
```

**Step 4** Display the statistics for authentication.

```
sensor# show statistics authentication
General
   totalAuthenticationAttempts = 128
   failedAuthenticationAttempts = 0
sensor#
```

**Step 5** Display the statistics for the denied attackers in the system.

```
sensor# show statistics denied-attackers
Denied Attackers and hit count for each.
Denied Attackers and hit count for each.
Statistics for Virtual Sensor vs0
   Denied Attackers with percent denied and hit count for each.


   Denied Attackers with percent denied and hit count for each.


Statistics for Virtual Sensor vs1
   Denied Attackers with percent denied and hit count for each.


   Denied Attackers with percent denied and hit count for each.


sensor#
```

**Step 6** Display the statistics for the Event Server.

```
sensor# show statistics event-server
General
   openSubscriptions = 0
   blockedSubscriptions = 0
Subscriptions
sensor#
```

**Step 7** Display the statistics for the Event Store.

```
sensor# show statistics event-store
EEvent store statistics
   General information about the event store
```

```
      The current number of open subscriptions = 2
      The number of events lost by subscriptions and queries = 0
      The number of filtered events not written to the event store = 850763
      The number of queries issued = 0
      The number of times the event store circular buffer has wrapped = 0
   Number of events of each type currently stored
      Status events = 4257
      Shun request events = 0
      Error events, warning = 669
      Error events, error = 8
      Error events, fatal = 0
      Alert events, informational = 0
      Alert events, low = 0
      Alert events, medium = 0
      Alert events, high = 0
      Alert events, threat rating 0-20 = 0
      Alert events, threat rating 21-40 = 0
      Alert events, threat rating 41-60 = 0
      Alert events, threat rating 61-80 = 0
      Alert events, threat rating 81-100 = 0
   Cumulative number of each type of event
      Status events = 4257
      Shun request events = 0
      Error events, warning = 669
      Error events, error = 8
      Error events, fatal = 0
      Alert events, informational = 0
      Alert events, low = 0
      Alert events, medium = 0
      Alert events, high = 0
      Alert events, threat rating 0-20 = 0
      Alert events, threat rating 21-40 = 0
      Alert events, threat rating 41-60 = 0
      Alert events, threat rating 61-80 = 0
      Alert events, threat rating 81-100 = 0
sensor#
```

**Step 8** Display the statistics for global correlation.

```
sensor# show statistics global-correlation
Network Participation:
   Counters:
      Total Connection Attempts = 0
      Total Connection Failures = 0
      Connection Failures Since Last Success = 0
   Connection History:
Updates:
   Status Of Last Update Attempt = Disabled
   Time Since Last Successful Update = never
   Counters:
      Update Failures Since Last Success = 0
      Total Update Attempts = 0
      Total Update Failures = 0
   Update Interval In Seconds = 300
   Update Server = update-manifests.ironport.com
   Update Server Address = Unknown
   Current Versions:
Warnings:
   Unlicensed = Global correlation inspection and reputation filtering have been
 disabled because the sensor is unlicensed.
   Action Required = Obtain a new license from http://www.cisco.com/go/license.
sensor#
```

**Step 9** Display the statistics for the host.

```
sensor# show statistics host
General Statistics
   Last Change To Host Config (UTC) = 25-Jan-2012 02:59:18
   Command Control Port Device = Management0/0
Network Statistics
    = ma0_0     Link encap:Ethernet  HWaddr 00:04:23:D5:A1:8D
    =           inet addr:10.89.130.98  Bcast:10.89.131.255  Mask:255.255.254.0
    =           UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
    =           RX packets:1688325 errors:0 dropped:0 overruns:0 frame:0
    =           TX packets:38546 errors:0 dropped:0 overruns:0 carrier:0
    =           collisions:0 txqueuelen:1000
    =           RX bytes:133194316 (127.0 MiB)  TX bytes:5515034 (5.2 MiB)
    =           Base address:0xcc80 Memory:fcee0000-fcf00000
NTP Statistics
   status = Not applicable
Memory Usage
   usedBytes = 1889357824
   freeBytes = 2210988032
   totalBytes = 4100345856
CPU Statistics
   Note: CPU Usage statistics are not a good indication of the sensor processin load. The
Inspection Load Percentage in the output of 'show inspection-load' should be used instead.
   Usage over last 5 seconds = 0
   Usage over last minute = 2
   Usage over last 5 minutes = 2
   Usage over last 5 seconds = 0
   Usage over last minute = 1
   Usage over last 5 minutes = 1
Memory Statistics
   Memory usage (bytes) = 1889357824
   Memory free (bytes) = 2210988032
Auto Update Statistics
   lastDirectoryReadAttempt = N/A
   lastDownloadAttempt = N/A
   lastInstallAttempt = N/A
   nextAttempt = N/A
Auxilliary Processors Installed
sensor#
```

**Step 10** Display the statistics for the logging application.

```
sensor# show statistics logger
The number of Log interprocessor FIFO overruns = 0
The number of syslog messages received = 11
The number of <evError> events written to the event store by severity
   Fatal Severity = 0
   Error Severity = 64
   Warning Severity = 35
   TOTAL = 99
The number of log messages written to the message log by severity
   Fatal Severity = 0
   Error Severity = 64
   Warning Severity = 24
   Timing Severity = 311
   Debug Severity = 31522
   Unknown Severity = 7
   TOTAL = 31928
sensor#
```

**Step 11** Display the statistics for the ARC.

```
sensor# show statistics network-access
Current Configuration
   LogAllBlockEventsAndSensors = true
```

```
      EnableNvramWrite = false
      EnableAclLogging = false
      AllowSensorBlock = false
      BlockMaxEntries = 11
      MaxDeviceInterfaces = 250
      NetDevice
         Type = PIX
         IP = 10.89.150.171
         NATAddr = 0.0.0.0
         Communications = ssh-3des
      NetDevice
         Type = PIX
         IP = 192.0.2.4
         NATAddr = 0.0.0.0
         Communications = ssh-3des
      NetDevice
         Type = PIX
         IP = 192.0.2.5
         NATAddr = 0.0.0.0
         Communications = telnet
      NetDevice
         Type = Cisco
         IP = 192.0.2.6
         NATAddr = 0.0.0.0
         Communications = telnet
         BlockInterface
            InterfaceName = ethernet0/1
            InterfaceDirection = out
            InterfacePostBlock = Post_Acl_Test
         BlockInterface
            InterfaceName = ethernet0/1
            InterfaceDirection = in
            InterfacePreBlock = Pre_Acl_Test
            InterfacePostBlock = Post_Acl_Test
      NetDevice
         Type = CAT6000_VACL
         IP = 192.0.2.1
         NATAddr = 0.0.0.0
         Communications = telnet
         BlockInterface
            InterfaceName = 502
            InterfacePreBlock = Pre_Acl_Test
         BlockInterface
            InterfaceName = 507
            InterfacePostBlock = Post_Acl_Test
   State
      BlockEnable = true
      NetDevice
         IP = 192.0.2.3
         AclSupport = Does not use ACLs
         Version = 6.3
         State = Active
         Firewall-type = PIX
      NetDevice
         IP = 192.0.2.7
         AclSupport = Does not use ACLs
         Version = 7.0
         State = Active
         Firewall-type = ASA
      NetDevice
         IP = 102.0.2.8
         AclSupport = Does not use ACLs
         Version = 2.2
         State = Active
```

```
      Firewall-type = FWSM
   NetDevice
      IP = 192.0.2.9
      AclSupport = uses Named ACLs
      Version = 12.2
      State = Active
   NetDevice
      IP = 192.0.2.10
      AclSupport = Uses VACLs
      Version = 8.4
      State = Active
   BlockedAddr
      Host
         IP = 203.0.113.1
         Vlan =
         ActualIp =
         BlockMinutes =
      Host
         IP = 203.0.113.2
         Vlan =
         ActualIp =
         BlockMinutes =
      Host
         IP = 203.0.113.4
         Vlan =
         ActualIp =
         BlockMinutes = 60
         MinutesRemaining = 24
      Network
         IP = 203.0.113.9
         Mask = 255.255.0.0
         BlockMinutes =
sensor#
```

**Step 12** Display the statistics for the notification application.

```
sensor# show statistics notification
General
   Number of SNMP set requests = 0
   Number of SNMP get requests = 0
   Number of error traps sent = 0
   Number of alert traps sent = 0
sensor#
```

**Step 13** Display the statistics for OS identification.

```
sensor# show statistics os-identification
Statistics for Virtual Sensor vs0
   OS Identification
      Configured
      Imported
      Learned
sensor#
```

**Step 14** Display the statistics for the SDEE server.

```
sensor# show statistics sdee-server
General
   Open Subscriptions = 1
   Blocked Subscriptions = 1
   Maximum Available Subscriptions = 5
   Maximum Events Per Retrieval = 500
Subscriptions
   sub-4-d074914f
      State = Read Pending
```

```
      Last Read Time = 23:54:16 UTC Wed Nov 30 2011
      Last Read Time (nanoseconds) = 1322697256078549000
sensor#
```

**Step 15** Display the statistics for the transaction server.

```
sensor# show statistics transaction-server
General
   totalControlTransactions = 35
   failedControlTransactions = 0
sensor#
```

**Step 16** Display the statistics for a virtual sensor.

```
sensor# show statistics virtual-sensor vs0
Statistics for Virtual Sensor vs0
      Name of current Signature-Defintion instance = sig0
      Name of current Event-Action-Rules instance = rules0
      List of interfaces monitored by this virtual sensor =
      General Statistics for this Virtual Sensor
         Number of seconds since a reset of the statistics = 1151770
         MemoryAlloPercent = 23
         MemoryUsedPercent = 22
         MemoryMaxCapacity = 3500000
         MemoryMaxHighUsed = 4193330
         MemoryCurrentAllo = 805452
         MemoryCurrentUsed = 789047
         Processing Load Percentage = 1
         Total packets processed since reset = 0
         Total IP packets processed since reset = 0
         Total IPv4 packets processed since reset = 0
         Total IPv6 packets processed since reset = 0
         Total IPv6 AH packets processed since reset = 0
         Total IPv6 ESP packets processed since reset = 0
         Total IPv6 Fragment packets processed since reset = 0
         Total IPv6 Routing Header packets processed since reset = 0
         Total IPv6 ICMP packets processed since reset = 0
         Total packets that were not IP processed since reset = 0
         Total TCP packets processed since reset = 0
         Total UDP packets processed since reset = 0
         Total ICMP packets processed since reset = 0
         Total packets that were not TCP, UDP, or ICMP processed since reset = 0
         Total ARP packets processed since reset = 0
         Total ISL encapsulated packets processed since reset = 0
         Total 802.1q encapsulated packets processed since reset = 0
         Total GRE Packets processed since reset = 0
         Total GRE Fragment Packets processed since reset = 0
         Total GRE Packets skipped since reset = 0
         Total GRE Packets with Bad Header skipped since reset = 0
         Total IpIp Packets with Bad Header skipped since reset = 0
         Total Encapsulated Tunnel Packets with Bad Header skipped since reset = 0
         Total packets with bad IP checksums processed since reset = 0
         Total packets with bad layer 4 checksums processed since reset = 0
         Total cross queue TCP packets processed since reset = 0
         Total cross queue UDP packets processed since reset = 0
         Packets dropped due to regex resources unavailable since reset = 0
         Total number of bytes processed since reset = 0
         The rate of packets per second since reset = 0
         The rate of bytes per second since reset = 0
         The average bytes per packet since reset = 0
      Denied Address Information
         Number of Active Denied Attackers = 0
         Number of Denied Attackers Inserted = 0
         Number of Denied Attacker Victim Pairs Inserted = 0
```

```
   Number of Denied Attacker Service Pairs Inserted = 0
   Number of Denied Attackers Total Hits = 0
   Number of times max-denied-attackers limited creation of new entry = 0
   Number of exec Clear commands during uptime = 0
Denied Attackers and hit count for each.
Denied Attackers with percent denied and hit count for each.


The Signature Database Statistics.
   The Number of each type of node active in the system
      Total nodes active = 0
      TCP nodes keyed on both IP addresses and both ports = 0
      UDP nodes keyed on both IP addresses and both ports = 0
      IP nodes keyed on both IP addresses = 0
   The number of each type of node inserted since reset
      Total nodes inserted = 0
      TCP nodes keyed on both IP addresses and both ports = 0
      UDP nodes keyed on both IP addresses and both ports = 0
      IP nodes keyed on both IP addresses = 0
   The rate of nodes per second for each time since reset
      Nodes per second = 0
      TCP nodes keyed on both IP addresses and both ports per second = 0
      UDP nodes keyed on both IP addresses and both ports per second = 0
      IP nodes keyed on both IP addresses per second = 0
   The number of root nodes forced to expire because of memory constraints
      TCP nodes keyed on both IP addresses and both ports = 0
   Packets dropped because they would exceed Database insertion rate limits = 0
Fragment Reassembly Unit Statistics for this Virtual Sensor
   Number of fragments currently in FRU = 0
   Number of datagrams currently in FRU = 0
   Number of fragments received since reset = 0
   Number of fragments forwarded since reset = 0
   Number of fragments dropped since last reset = 0
   Number of fragments modified since last reset = 0
   Number of complete datagrams reassembled since last reset = 0
   Fragments hitting too many fragments condition since last reset = 0
   Number of overlapping fragments since last reset = 0
   Number of Datagrams too big since last reset = 0
   Number of overwriting fragments since last reset = 0
   Number of Inital fragment missing since last reset = 0
   Fragments hitting the max partial dgrams limit since last reset = 0
   Fragments too small since last reset = 0
   Too many fragments per dgram limit since last reset = 0
   Number of datagram reassembly timeout since last reset = 0
   Too many fragments claiming to be the last since last reset = 0
   Fragments with bad fragment flags since last reset = 0
TCP Normalizer stage statistics
   Packets Input = 0
   Packets Modified = 0
   Dropped packets from queue = 0
   Dropped packets due to deny-connection = 0
   Duplicate Packets = 0
   Current Streams = 0
   Current Streams Closed = 0
   Current Streams Closing = 0
   Current Streams Embryonic = 0
   Current Streams Established = 0
   Current Streams Denied = 0
   Total SendAck Limited Packets = 0
   Total SendAck Limited Streams = 0
   Total SendAck Packets Sent = 0
Statistics for the TCP Stream Reassembly Unit
   Current Statistics for the TCP Stream Reassembly Unit
      TCP streams currently in the embryonic state = 0
```

```
            TCP streams currently in the established state = 0
            TCP streams currently in the closing state = 0
            TCP streams currently in the system = 0
            TCP Packets currently queued for reassembly = 0
         Cumulative Statistics for the TCP Stream Reassembly Unit since reset
            TCP streams that have been tracked since last reset = 0
            TCP streams that had a gap in the sequence jumped = 0
            TCP streams that was abandoned due to a gap in the sequence = 0
            TCP packets that arrived out of sequence order for their stream = 0
            TCP packets that arrived out of state order for their stream = 0
            The rate of TCP connections tracked per second since reset = 0
      SigEvent Preliminary Stage Statistics
         Number of Alerts received = 0
         Number of Alerts Consumed by AlertInterval = 0
         Number of Alerts Consumed by Event Count = 0
         Number of FireOnce First Alerts = 0
         Number of FireOnce Intermediate Alerts = 0
         Number of Summary First Alerts  = 0
         Number of Summary Intermediate Alerts  = 0
         Number of Regular Summary Final Alerts  = 0
         Number of Global Summary Final Alerts  = 0
         Number of Active SigEventDataNodes  = 0
         Number of Alerts Output for further processing = 0
--MORE--
```

**Step 17** Display the statistics for the web server.

```
sensor# show statistics web-server
listener-443
   session-11
      remote host = 64.101.182.167
      session is persistent = no
      number of requests serviced on current connection = 1
      last status code = 200
      last request method = GET
      last request URI = cgi-bin/sdee-server
      last protocol version = HTTP/1.1
      session state = processingGetServlet
   number of server session requests handled = 957134
   number of server session requests rejected = 0
   total HTTP requests handled = 365871
   maximum number of session objects allowed = 40
   number of idle allocated session objects = 12
   number of busy allocated session objects = 1
summarized log messages
   number of TCP socket failure messages logged = 0
   number of TLS socket failure messages logged = 0
   number of TLS protocol failure messages logged = 0
   number of TLS connection failure messages logged = 595015
   number of TLS crypto warning messages logged = 0
   number of TLS expired certificate warning messages logged = 0
   number of receipt of TLS fatal alert message messages logged = 594969
crypto library version = 6.2.1.0
sensor#
```

**Step 18** Clear the statistics for an application, for example, the logging application. The statistics are retrieved and cleared.

```
sensor# show statistics logger clear
The number of Log interprocessor FIFO overruns = 0
The number of syslog messages received = 141
The number of <evError> events written to the event store by severity
   Fatal Severity = 0
   Error Severity = 14
```

```
   Warning Severity = 142
   TOTAL = 156
The number of log messages written to the message log by severity
   Fatal Severity = 0
   Error Severity = 14
   Warning Severity = 1
   Timing Severity = 0
   Debug Severity = 0
   Unknown Severity = 28
   TOTAL = 43
```

**Step 19** Verify that the statistics have been cleared. The statistics now all begin from 0.

```
sensor# show statistics logger
The number of Log interprocessor FIFO overruns = 0
The number of syslog messages received = 0
The number of <evError> events written to the event store by severity
   Fatal Severity = 0
   Error Severity = 0
   Warning Severity = 0
   TOTAL = 0
The number of log messages written to the message log by severity
   Fatal Severity = 0
   Error Severity = 0
   Warning Severity = 0
   Timing Severity = 0
   Debug Severity = 0
   Unknown Severity = 0
   TOTAL = 0
sensor#
```

# Interfaces Information

The **show interfaces** command is useful for gathering information on the sensing and command and control interfaces. This section describes the **show interfaces** command, and contains the following topics:


- Understanding the show interfaces Command, page E-97
- Interfaces Command Output, page E-98


## Understanding the show interfaces Command

You can learn the following information from the **show interfaces** command:

- Whether the interface is up or down
- Whether or not packets are being seen, and on which interfaces
- Whether or not packets are being dropped by SensorApp
- Whether or not there are errors being reported by the interfaces that can result in packet drops

The **show interfaces** command displays statistics for all system interfaces. Or you can use the individual commands to display statistics for the command and control interface (**show interfaces** *command_control_interface_name*), the sensing interface (**show interfaces** *interface_name*).

## Interfaces Command Output

The following example shows the output from the **show interfaces** command:

```
sensor# show interfaces
Interface Statistics
   Total Packets Received = 0
   Total Bytes Received = 0
   Missed Packet Percentage = 0
   Current Bypass Mode = Auto_off
MAC statistics from interface GigabitEthernet0/1
   Media Type = backplane
   Missed Packet Percentage = 0
   Inline Mode = Unpaired
   Pair Status = N/A
   Link Status = Up
   Link Speed = Auto_1000
   Link Duplex = Auto_Full
   Total Packets Received = 0
   Total Bytes Received = 0
   Total Multicast Packets Received = 0
   Total Broadcast Packets Received = 0
   Total Jumbo Packets Received = 0
   Total Undersize Packets Received = 0
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 0
   Total Bytes Transmitted = 0
   Total Multicast Packets Transmitted = 0
   Total Broadcast Packets Transmitted = 0
   Total Jumbo Packets Transmitted = 0
   Total Undersize Packets Transmitted = 0
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
MAC statistics from interface GigabitEthernet0/0
   Media Type = TX
   Link Status = Up
   Link Speed = Auto_100
   Link Duplex = Auto_Full
   Total Packets Received = 2211296
   Total Bytes Received = 157577635
   Total Multicast Packets Received = 20
   Total Receive Errors = 0
   Total Receive FIFO Overruns = 0
   Total Packets Transmitted = 239723
   Total Bytes Transmitted = 107213390
   Total Transmit Errors = 0
   Total Transmit FIFO Overruns = 0
sensor#
```

# Events Information

You can use the **show events** command to view the alerts generated by SensorApp and errors generated by an application. This section describes the **show events** command, and contains the following topics:


- Sensor Events, page E-99
- Understanding the show events Command, page E-99

- Displaying Events, page E-99
- Clearing Events, page E-102


## Sensor Events

There are five types of events:

- evAlert—Intrusion detection alerts
- evError—Application errors
- evStatus—Status changes, such as an IP log being created
- evLogTransaction—Record of control transactions processed by each sensor application
- evShunRqst—Block requests

Events remain in the Event Store until they are overwritten by newer events.

## Understanding the show events Command

The **show events** command is useful for troubleshooting event capture issues in which you are not seeing events in Event Viewer or Security Monitor. You can use the **show events** command to determine which events are being generated on the sensor to make sure events are being generated and that the fault lies with the monitoring side.

You can clear all events from Event Store by using the **clear events** command.

Here are the parameters for the **show events** command:

```
sensor# show events
<cr>
alert           Display local system alerts.
error           Display error events.
hh:mm[:ss]      Display start time.
log             Display log events.
nac             Display NAC shun events.
past            Display events starting in the past specified time.
status          Display status events.
|               Output modifiers.
```

## Displaying Events

**Note** The Event Store has a fixed size of 30 MB for all platforms.

**Note** Events are displayed as a live feed. To cancel the request, press **Ctrl-C.**

Use the **show events** [{**alert** [informational] [low] [medium] [high] [**include-traits** ***traits***] [**exclude-traits** ***traits***] [**min-threat-rating** *min-rr*] [**max-threat-rating** *max-rr*] | **error** [warning] [error] [fatal] | **NAC** | **status**}] [*hh:mm:ss* [*month day* [*year*]] | **past** *hh:mm:ss*] command to display events from Event Store. Events are displayed beginning at the start time. If you do not specify a start time, events are displayed beginning at the current time. If you do not specify an event type, all events are displayed.

The following options apply:

- **alert**—Displays alerts. Provides notification of some suspicious activity that may indicate an attack is in process or has been attempted. Alert events are generated by the Analysis Engine whenever a signature is triggered by network activity. If no level is selected (informational, low, medium, or high), all alert events are displayed.
- **include-traits**—Displays alerts that have the specified traits.
- **exclude-traits**—Does not display alerts that have the specified traits.
- **traits**—Specifies the trait bit position in decimal (0 to 15).
- **min-threat-rating**—Displays events with a threat rating above or equal to this value. The default is 0. The valid range is 0 to 100.
- **max-threat-rating**—Displays events with a threat rating below or equal to this value. The default is 100. The valid range is 0 to 100.
- **error**—Displays error events. Error events are generated by services when error conditions are encountered. If no level is selected (warning, error, or fatal), all error events are displayed.
- **NAC**—Displays the ARC (block) requests.

  **Note** The ARC is formerly known as NAC. This name change has not been completely implemented throughout the IDM, the IME, and the CLI for Cisco IPS 7.1.

- **status**—Displays status events.
- **past**—Displays events starting in the past for the specified hours, minutes, and seconds.
- *hh:mm:ss*—Specifies the hours, minutes, and seconds in the past to begin the display.

**Note** The **show events** command continues to display events until a specified event is available. To exit, press **Ctrl-C**.

### Displaying Events

To display events from the Event Store, follow these steps:

**Step 1** Log in to the CLI.

**Step 2** Display all events starting now. The feed continues showing all events until you press **Ctrl-C**.

```
sensor# show events
evError: eventId=1041472274774840147 severity=warning vendor=Cisco
  originator:
    hostId: sensor2
    appName: cidwebserver
    appInstanceId: 12075
  time: 2011/01/07 04:41:45 2011/01/07 04:41:45 UTC
  errorMessage: name=errWarning received fatal alert: certificate_unknown

evError: eventId=1041472274774840148 severity=error vendor=Cisco
  originator:
    hostId: sensor2
    appName: cidwebserver
    appInstanceId: 351
  time: 2011/01/07 04:41:45 2011/01/07 04:41:45 UTC
  errorMessage: name=errTransport WebSession::sessionTask(6) TLS connection exception:
handshake incomplete.
```

**Step 3** Display the block requests beginning at 10:00 a.m. on February 9, 2011.

```
sensor# show events NAC 10:00:00 Feb 9 2011
evShunRqst: eventId=1106837332219222281 vendor=Cisco
  originator:
    deviceName: Sensor1
    appName: NetworkAccessControllerApp
    appInstance: 654
  time: 2011/02/09 10:33:31 2011/08/09 13:13:31
  shunInfo:
    host: connectionShun=false
      srcAddr: 11.0.0.1
      destAddr:
      srcPort:
      destPort:
      protocol: numericType=0 other
    timeoutMinutes: 40
  evAlertRef: hostId=esendHost 123456789012345678
sensor#
```

**Step 4** Display errors with the warning level starting at 10:00 a.m. on February 9, 2011.

```
sensor# show events error warning 10:00:00 Feb 9 2011
evError: eventId=1041472274774840197 severity=warning vendor=Cisco
  originator:
    hostId: sensor
    appName: cidwebserver
    appInstanceId: 12160
  time: 2011/01/07 04:49:25 2011/01/07 04:49:25 UTC
  errorMessage: name=errWarning received fatal alert: certificate_unknown
```

**Step 5** Display alerts from the past 45 seconds.

```
sensor# show events alert past 00:00:45

evIdsAlert: eventId=1109695939102805307 severity=medium vendor=Cisco
  originator:
    hostId: sensor
    appName: sensorApp
    appInstanceId: 367
  time: 2011/03/02 14:15:59 2011/03/02 14:15:59 UTC
  signature: description=Nachi Worm ICMP Echo Request id=2156 version=S54
    subsigId: 0
    sigDetails: Nachi ICMP
  interfaceGroup:
  vlan: 0
  participants:
    attacker:
      addr: locality=OUT 10.89.228.202
    target:
      addr: locality=OUT 10.89.150.185
  riskRatingValue: 70
  interface: fe0_1
  protocol: icmp


evIdsAlert: eventId=1109695939102805308 severity=medium vendor=Cisco
  originator:
--MORE--
```

**Step 6** Display events that began 30 seconds in the past.

```
sensor# show events past 00:00:30
evStatus: eventId=1041526834774829055 vendor=Cisco
```

```
  originator:
    hostId: sensor
    appName: mainApp
    appInstanceId: 2215
  time: 2011/01/08 02:41:00 2011/01/08 02:41:00 UTC
  controlTransaction: command=getVersion successful=true
    description: Control transaction response.
    requestor:
      user: cids
      application:
        hostId: 64.101.182.101
        appName: -cidcli
        appInstanceId: 2316


evStatus: eventId=1041526834774829056 vendor=Cisco
  originator:
    hostId: sensor
    appName: login(pam_unix)
    appInstanceId: 2315
  time: 2011/01/08 02:41:00 2011/01/08 02:41:00 UTC
  syslogMessage:
    description: session opened for user cisco by cisco(uid=0)
```

## Clearing Events

Use the **clear events** command to clear the Event Store.

To clear events from the Event Store, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Clear the Event Store.

```
sensor# clear events
Warning: Executing this command will remove all events currently stored in the event
store.
Continue with clear? []:
```

**Step 3** Enter **yes** to clear the events.

# cidDump Script

If you do not have access to the IDM, the IME, or the CLI, you can run the underlying script cidDump from the service account by logging in as root and running /usr/cids/idsRoot/bin/cidDump. The path of the cidDump file is /usr/cids/idsRoot/htdocs/private/cidDump.html. cidDump is a script that captures a large amount of information including the IPS processes list, log files, OS information, directory listings, package information, and configuration files.

To run the cidDump script, follow these steps:

**Step 1** Log in to the sensor service account.

**Step 2** **Su** to **root** using the service account password.

**Step 3** Enter the following command.

```
/usr/cids/idsRoot/bin/cidDump
```

**Step 4** Enter the following command to compress the resulting /usr/cids/idsRoot/log/cidDump.html file.

```
gzip /usr/cids/idsRoot/log/cidDump.html
```

**Step 5** Send the resulting HTML file to TAC or the IPS developers in case of a problem.

### For More Information

For the procedure for putting a file on the Cisco FTP site, see Uploading and Accessing Files on the Cisco FTP Site, page E-103.

# Uploading and Accessing Files on the Cisco FTP Site

You can upload large files, for example, cidDump.html, the **show tech-support** command output, and cores, to the ftp-sj server.

To upload and access files on the Cisco FTP site, follow these steps:

**Step 1** Log in to ftp-sj.cisco.com as anonymous.

**Step 2** Change to the /incoming directory.

**Step 3** Use the **put** command to upload the files. Make sure to use the binary transfer type.

**Step 4** To access uploaded files, log in to an ECS-supported host.

**Step 5** Change to the /auto/ftp/incoming directory.

# Cable Pinouts

## Contents

This appendix describes pinout information for 10/100/1000BaseT, console, and RJ 45 to DB 9 ports, and the MGMT 10/100 Ethernet port. It contains the following topics:


- 10/100BaseT and 10/100/1000BaseT Connectors, page F-1
- Console Port (RJ-45), page F-2
- RJ-45 to DB-9 or DB-25, page F-3


## 10/100BaseT and 10/100/1000BaseT Connectors

The ASA 5585-Xappliance supports 10/100/1000BaseT ports. You must use at least a Category 5 cable for 100/1000Base-TX operations. You can use a Category 3 cable for 10Base-TX operations.

Figure F-1 shows the 10/100BaseT (RJ-45) port pinouts.

***Figure F-1 10/100 Port Pinouts***

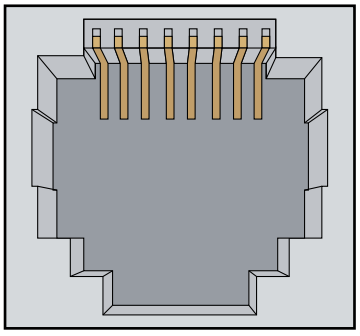
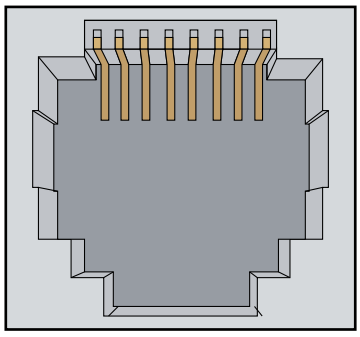
| Pin | Label | 1 2 3 4 5 6 7 8 |
|---|---|---|
| 1 | TD+ |  |
| 2 | TD- | |
| 3 | RD+ | |
| 4 | NC | |
| 5 | NC | |
| 6 | RD- | |
| 7 | NC | |
| 8 | NC | |

Figure F-2 shows the 10/100/1000BaseT (RJ-45) port pinouts.

*Figure F-2 10/100/1000 Port Pinouts*

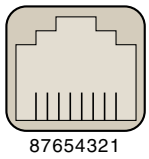
| Pin | Label | 1 2 3 4 5 6 7 8 |
|---|---|---|
| 1 | TP0+ |  |
| 2 | TP0- | |
| 3 | TP1+ | |
| 4 | TP2+ | |
| 5 | TP2- | |
| 6 | TP1- | |
| 7 | TP3+ | |
| 8 | TP3- | |

148410

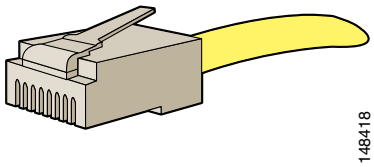
# Console Port (RJ-45)

Figure F-3 shows the RJ 45 cable.

*Figure F-3 RJ-45 Cable*



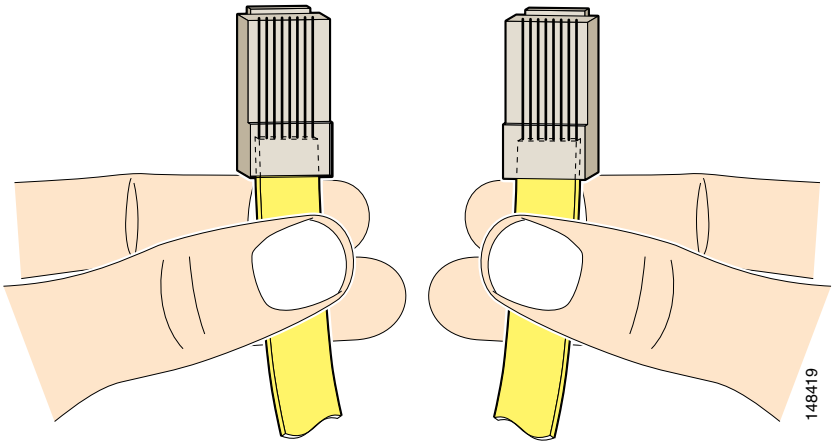

RJ-45 connector



148418

To identify the RJ-45 cable type, hold the two ends of the cable next to each other so that you can see the colored wires inside the ends, as shown in Figure F-4.

*Figure F-4 RJ-45 Cable Identification*



148419

Examine the sequence of colored wires to determine the type of RJ-45 cable, as follows:

- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Cross-over—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable.
- Roll-over—The colored wires are in the opposite sequence at either end of the cable.

Table F-1 lists the roll-over (console) cable pinouts for RJ-45.

*Table F-1 RJ-45 Roll-Over (Console) Cable Pinouts*

| Pin | Pin |
|---|---|
| 1 | 8 |
| 2 | 7 |
| 3 | 6 |
| 4 | 5 |
| 5 | 4 |
| 6 | 3 |
| 7 | 2 |
| 8 | 1 |

# RJ-45 to DB-9 or DB-25

Table F-2 lists the cable pinouts for RJ-45 to DB-9.

*Table F-2 Cable Pinouts for RJ-45 to DB-9*

| Signal | Console Port | RJ-45 Pin | DB-9 Pin | Signal |
|---|---|---|---|---|
| RTS | 1 | 8 | 7 | CTS |
| DTR | 2 | 7 | 4 | DSR |
| TxD | 3 | 6 | 3 | RxD |
| GND | 4 | 5 | 5 | GND |
| GND | 5 | 4 | 5 | GND |
| RxD | 6 | 3 | 2 | TxD |
| DSR | 7 | 2 | 6 | DTR |
| CTS | 8 | 1 | 8 | RTS |

**Revised: September 30, 2014**

## Numerals

**3DES** Triple Data Encryption Standard. A stronger version of DES, which is the default encryption method for SSH version 1.5. Used when establishing an SSH session with the sensor. It can be used when the sensor is managing a device.

**802.x** A set of IEEE standards for the definition of LAN protocols.

## A

**AAA** authentication, authorization, and accounting. Pronounced “triple a.” The primary and recommended method for access control in Cisco devices.

**ACE** Access Control Entry. An entry in the ACL that describes what action should be taken for a specified address or protocol. The sensor adds/removes ACE to block hosts.

**ACK** acknowledgment. Notification sent from one network device to another to acknowledge that some event occurred (for example, the receipt of a message).

**ACL** Access Control List. A list of ACEs that control the flow of data through a router. There are two ACLs per router interface for inbound data and outbound data. Only one ACL per direction can be active at a time. ACLs are identified by number or by name. ACLs can be standard, enhanced, or extended. You can configure the sensor to manage ACLs.

**ACS server** Cisco Access Control Server. A RADIUS security server that is the centralized control point for managing network users, network administrators, and network infrastructure resources.

**action** The response of the sensor to an event. An action only happens if the event is not filtered. Examples include TCP reset, block host, block connection, IP logging, and capturing the alert trigger packet.

**active ACL** The ACL created and maintained by ARC and applied to the router block interfaces.

**adaptive security appliance** ASA. Combines firewall, VPN concentrator, and intrusion prevention software functionality into one software image. You can configure the adaptive security appliance in single mode or multi-mode.

**AIC engine** Application Inspection and Control engine. Provides deep analysis of web traffic. It provides granular control over HTTP sessions to prevent abuse of the HTTP protocol. It allows administrative control over applications that try to tunnel over specified ports, such as instant messaging, and tunneling applications, such as gotomypc. It can also inspect FTP traffic and control the commands being issued.

**ASA 5500 AIP SSM** Advanced Inspection and Prevention Security Services Module. The IPS plug-in module in the Cisco ASA 5500 series adaptive security appliance. The ASA 5500 AIP SSM is an IPS services module that monitors and performs real-time analysis of network traffic by looking for anomalies and misuse based on an extensive, embedded signature library. When the ASA 5500 AIP SSM detects unauthorized activity, it can terminate the specific connection, permanently block the attacking host, log the incident, and send an alert to the device manager. See also adaptive security appliance.

**ASA 5500-X IPS SSP** Intrusion Prevention System Security Services Processor. The IPS is running as a service and ASA controls sending and receiving traffic to and from the IPS. The IPS services processor monitors and performs real-time analysis of network traffic by looking for anomalies and misuse based on an extensive, embedded signature library. When the ASA 5500-X IPS SSP detects unauthorized activity, it can terminate the specific connection, permanently block the attacking host, log the incident, and send an alert to the device manager. See also adaptive security appliance.

**ASA 5585-X IPS SSP** Intrusion Prevention System Security Services Processor. The IPS plug-in module in the Cisco ASA 5585-X adaptive security appliance. The ASA 5585-X IPS SSP is an IPS services processor that monitors and performs real-time analysis of network traffic by looking for anomalies and misuse based on an extensive, embedded signature library. When the ASA 5585-X IPS SSP detects unauthorized activity, it can terminate the specific connection, permanently block the attacking host, log the incident, and send an alert to the device manager. See also adaptive security appliance.

**Alarm Channel** The IPS software module that processes all signature events generated by the inspectors. Its primary function is to generate alerts for each event it receives.

**alert** Specifically, an IPS event type; it is written to the Event Store as an evidsAlert. In general, an alert is an IPS message that indicates a network exploit in progress or a potential security problem occurrence. Also known as an alarm.

**Analysis Engine** The IPS software module that handles sensor configuration. It maps the interfaces and also the signature and alarm channel policy to the configured interfaces. It performs packet analysis and alert detection. The Analysis Engine functionality is provided by the SensorApp process.

**anomaly detection** AD. The sensor component that creates a baseline of normal network traffic and then uses this baseline to detect worm-infected hosts.

**API** Application Programming Interface. The means by which an application program talks to communications software. Standardized APIs allow application programs to be developed independently of the underlying method of communication. Computer application programs run a set of standard software interrupts, calls, and data formats to initiate contact with other devices (for example, network services, mainframe communications programs, or other program-to-program communications). Typically, APIs make it easier for software developers to create links that an application needs to communicate with the operating system or with the network.

**application** Any program (process) designed to run in the Cisco IPS environment.

**application image** Full IPS image stored on a permanent storage device used for operating the sensor.

**application instance** A specific application running on a specific piece of hardware in the IPS environment. An application instance is addressable by its name and the IP address of its host computer.

**application partition** The bootable disk or compact-flash partition that contains the IPS software image.

**ARC** Attack Response Controller. Formerly known as Network Access Controller (NAC). A component of the IPS. A software module that provides block and unblock functionality where applicable.

**architecture** The overall structure of a computer or communication system. The architecture influences the capabilities and limitations of the system.

**ARP** Address Resolution Protocol. Internet protocol used to map an IP address to a MAC address. Defined in RFC 826.

**ASDM** Adaptive Security Device Manager. A web-based application that lets you configure and manage your adaptive security device.

**ASN.1** Abstract Syntax Notation 1. Standard for data presentation.

**aspect version** Version information associated with a group of IDIOM default configuration settings. For example, Cisco Systems publishes the standard set of attack signatures as a collection of default settings with the S aspect. The S-aspect version number is displayed after the S in the signature update package file name. Other aspects include the Virus signature definitions in the V-aspect and IDIOM signing keys in the key-aspect.

**atomic attack** Represents exploits contained within a single packet. For example, the “ping of death” attack is a single, abnormally large ICMP packet.

**Atomic engine** There are two Atomic engines: Atomic IP inspects IP protocol packets and associated Layer-4 transport protocols, and Atomic ARP inspects Layer-2 ARP protocol.

**attack** An assault on system security that derives from an intelligent threat, that is, an intelligent act that is a deliberate attempt (especially in the sense of method or technique) to evade security services and violate the security policy of a system.

**attack relevance rating** ARR. A weight associated with the relevancy of the targeted OS. The attack relevance rating is a derived value (relevant, unknown, or not relevant), which is determined at alert time. The relevant OSes are configured per signature.

**attack severity rating** ASR. A weight associated with the severity of a successful exploit of the vulnerability. The attack severity rating is derived from the alert severity parameter (informational, low, medium, or high) of the signature. The attack severity rating is configured per signature and indicates how dangerous the event detected is.

**authentication** Process of verifying that a user has permission to use the system, usually by means of a password key or certificate.

**AuthenticationApp** A component of the IPS. Authorizes and authenticates users based on IP address, password, and digital certificates.

**autostate** In normal autostate mode, the Layer 3 interfaces remain up if at least one port in the VLAN remains up. If you have appliances, such as load balancers or firewall servers that are connected to the ports in the VLAN, you can configure these ports to be excluded from the autostate feature to make sure that the forwarding SVI does not go down if these ports become inactive.

**AV** Anti-Virus.

## B

**backplane** The physical connection between an interface processor or card and the data buses and the power distribution buses inside a chassis.

**base version** A software release that must be installed before a follow-up release, such as a service pack or signature update, can be installed. Major and minor updates are base version releases.

**benign trigger** A situation in which a signature is fired correctly, but the source of the traffic is nonmalicious.

**BIOS** Basic Input/Output System. The program that starts the sensor and communicates between the devices in the sensor and the system.

**blackhole** Routing term for an area of the internetwork where packets enter, but do not emerge, due to adverse conditions or poor system configuration within a portion of the network.

**block** The ability of the sensor to direct a network device to deny entry to all packets from a specified network host or network.

**block interface** The interface on the network device that the sensor manages.

**BO** BackOrifice. The original Windows back door Trojan that ran over UDP only.

**BO2K** BackOrifice 2000. A Windows back door Trojan that runs over TCP and UDP.

**bootloader** A small set of system software that runs when the system first powers up. It loads the operating system (from the disk, network, external compact flash, or external USB flash), which loads and runs the IPS application. For the AIM IPS, it boots the module from the network and assists in software installation and upgrades, disaster recovery, and other operations when the module cannot access its software.

**Botnets** A collection of software robots, or bots, that run autonomously and automatically. The term is often associated with malicious software but it can also refer to the network of computers using distributed computing software. The term Botnet is used to refer to a collection of compromised computers (called Zombie computers) running software, usually installed through worms, Trojan horses, or back doors, under a common command-and-control infrastructure.

**Bpdu** Bridge Protocol Data Unit. Spanning-Tree Protocol hello packet that is sent out at configurable intervals to exchange information among bridges in the network.

**bypass mode** Mode that lets packets continue to flow through the sensor even if the sensor fails. Bypass mode is only applicable to inline-paired interfaces.

## C

**CA** certification authority. Entity that issues digital certificates (especially X.509 certificates) and vouches for the binding between the data items in a certificate. Sensors use self-signed certificates.

**CA certificate** Certificate for one CA issued by another CA.

**CEF** Cisco Express Forwarding. CEF is advanced, Layer 3 IP switching technology. CEF optimizes network performance and scalability for networks with large and dynamic traffic patterns, such as the Internet, on networks characterized by intensive Web-based applications, or interactive sessions.

**certificate** Digital representation of user or device attributes, including a public key, that is signed with an authoritative private key.

**cidDump** A script that captures a large amount of information including the IPS processes list, log files, OS information, directory listings, package information, and configuration files.

**CIDEE** Cisco Intrusion Detection Event Exchange. Specifies the extensions to SDEE that are used by Cisco IPS systems. The CIDEE standard specifies all possible extensions that may be supported by Cisco IPS systems.

**CIDS header** The header that is attached to each packet in the IPS system. It contains packet classification, packet length, checksum results, timestamp, and the receive interface.

**cipher key** The secret binary data used to convert between clear text and cipher text. When the same cipher key is used for both encryption and decryption, it is called symmetric. When it is used for either encryption or decryption (but not both), it is called asymmetric.

**Cisco IOS** Cisco system software that provides common functionality, scalability, and security for all products under the CiscoFusion architecture. Cisco IOS allows centralized, integrated, and automated installation and management of internetworks while supporting a wide variety of protocols, media, services, and platforms.

**CLI** command-line interface. A shell provided with the sensor used for configuring and controlling the sensor applications.

**CollaborationApp** A component of the IPS. Shares information with other devices through a global correlation database to improve the combined efficacy of all the devices.

**command and control interface** The interface on the sensor that communicates with the IPS manager and other network devices. This interface has an assigned IP address.

**community** In SNMP, a logical group of managed devices and NMSs in the same administrative domain.

**composite attack** Spans multiple packets in a single session. Examples include most conversation attacks such as FTP, Telnet, and most Regex-based attacks.

**connection block** ARC blocks traffic from a given source IP address to a given destination IP address and destination port.

**console** A terminal or laptop computer used to monitor and control the sensor.

**console port** An RJ45 or DB9 serial port on the sensor that is used to connect to a console device.

**control interface** When ARC opens a Telnet or SSH session with a network device, it uses one of the routing interfaces of the device as the remote IP address. This is the control interface.

**control transaction** CT. An IPS message containing a command addressed to a specific application instance. Control transactions can be sent between a management application and an IPS sensor, or between applications on the same IPS sensor. Example control transactions include *start*, *stop*, *getConfig*.

**Control Transaction Server** A component of the IPS. Accepts control transactions from a remote client, initiates a local control transaction, and returns the response to the remote client.

**Control Transaction Source** A component of the IPS. Waits for control transactions directed to remote applications, forwards the control transactions to the remote node, and returns the response to the initiator.

**cookie** A piece of information sent by a web server to a web browser that the browser is expected to save and send back to the web server whenever the browser makes additional requests of the web server.

**CSA MC** Cisco Security Agent Management Center. CSA MC receives host posture information from the CSA agents it manages. It also maintains a watch list of IP addresses that it has determined should be quarantined from the network.

**CSM** Cisco Security Manager, the provisioning component of the Cisco Self-Defending Networks solution. CS-Manager is fully integrated with CS-MARS.

**CS-MARS** Cisco Security Monitoring, Analysis and Reporting System. The monitoring component of the Cisco Self-Defending Networks solution. CS-MARS is fully integrated with CS-Manager

**cut-through architecture** Cut-through architecture is one method of design for packet-switching systems. When a packet arrives at a switch, the switch starts forwarding the packet almost immediately, reading only the first few bytes in the packet to learn the destination address. This technique improves performance

**CVE** Common Vulnerabilities and Exposures. A list of standardized names for vulnerabilities and other information security exposures maintained at http://cve.mitre.org/.

## D

**darknets** A virtual private network where users connect only to people they trust. In its most general meaning, a darknet can be any type of closed, private group of people communicating, but the name is most often used specifically for file-sharing networks. Darknet can be used to refer collectively to all covert communication networks.

**Database Processor** A processor in the IPS. Maintains the signature state and flow databases.

**datagram** Logical grouping of information sent as a network layer unit over a transmission medium without prior establishment of a virtual circuit. IP datagrams are the primary information units in the Internet. The terms cell, frame, message, packet, and segment also are used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

**DCE** data circuit-terminating equipment (ITU-T expansion). Devices and connections of a communications network that comprise the network end of the user-to-network interface. The DCE provides a physical connection to the network, forwards traffic, and provides a clocking signal used to synchronize data transmission between DCE and DTE devices. Modems and interface cards are examples of DCE.

**DCOM** Distributed Component Object Model. Protocol that enables software components to communicate directly over a network. Developed by Microsoft and previously called Network OLE, DCOM is designed for use across multiple network transports, including such Internet protocols as HTTP.

**DDoS** Distributed Denial of Service. An attack in which a multitude of compromised systems attack a single target, thereby causing denial of service for users of the targeted system. The flood of incoming messages to the target system essentially forces it to shut down, thereby denying service to the system to legitimate users.

**Deny Filters Processor** A processor in the IPS. Handles the deny attacker functions. It maintains a list of denied source IP addresses.

**DES** Data Encryption Standard. A strong encryption method where the strength lies in a 56-bit key rather than an algorithm.

**destination address** Address of a network device that is receiving data.

**DIMM** Dual In-line Memory Modules.

**DMZ** demilitarized zone. A separate network located in the neutral zone between a private (inside) network and a public (outside) network.

**DNS** Domain Name System. An Internet-wide hostname to IP address mapping. DNS enables you to convert human-readable names into the IP addresses needed for network packets.

**DoS** Denial of Service. An attack whose goal is just to disrupt the operation of a specific system or network.

**DRAM** dynamic random-access memory. RAM that stores information in capacitors that must be refreshed periodically. Delays can occur because DRAMs are inaccessible to the processor when refreshing their contents. However, DRAMs are less complex and have greater capacity than SRAMs.

**DTE** Data Terminal Equipment. Refers to the role of a device on an RS-232C connection. A DTE writes data to the transmit line and reads data from the receive line.

**DTP** Dynamic Trunking Protocol. A Cisco proprietary protocol in the VLAN group used for negotiating trunking on a link between two devices and for negotiating the type of trunking encapsulation (ISL or 802.1q) to be used.

## E

**ECLB** Ether Channel Load Balancing. Lets a Catalyst switch split traffic flows over different physical paths.

**egress** Traffic leaving the network.

**encryption** Application of a specific algorithm to data to alter the appearance of the data making it incomprehensible to those who are not authorized to see the information.

**engine** A component of the sensor designed to support many signatures in a certain category. Each engine has parameters that can be used to create signatures or tune existing signatures.

**enterprise network** Large and diverse network connecting most major points in a company or other organization. Differs from a WAN in that it is privately owned and maintained.

**escaped expression** Used in regular expression. A character can be represented as its hexadecimal value, for example, \x61 equals ‘a,’ so \x61 is an escaped expression representing the character ‘a.’

**ESD** electrostatic discharge. Electrostatic discharge is the rapid movement of a charge from one object to another object, which produces several thousand volts of electrical charge that can cause severe damage to electronic components or entire circuit card assemblies.

**event** An IPS message that contains an alert, a block request, a status message, or an error message.

**Event Store** One of the components of the IPS. A fixed-size, indexed store (30 MB) used to store IPS events.

**evIdsAlert** The XML entity written to the Event Store that represents an alert.

## F

**fail closed** Blocks traffic on the device after a hardware failure.

**fail open** Lets traffic pass through the device after a hardware failure.

**false negative** A signature is not fired when offending traffic is detected.

**false positive** Normal traffic or a benign action causes a signature to fire.

**Fast Ethernet** Any of a number of 100-Mbps Ethernet specifications. Fast Ethernet offers a speed increase 10 times that of the 10BaseT Ethernet specification while preserving such qualities as frame format, MAC mechanisms, and MTU. Such similarities allow the use of existing 10BaseT applications and network management tools on Fast Ethernet networks. Based on an extension to the IEEE 802.3 specification.

**Fast flux** Fast flux is a DNS technique used by Botnets to hide phishing and malware delivery sites behind an ever-changing network of compromised hosts acting as proxies. It can also refer to the combination of peer-to-peer networking, distributed command and control, web-based load balancing and proxy redirection used to make malware networks more resistant to discovery and counter-measures. The Storm Worm is one of the recent malware variants to make use of this technique.

**firewall** Router or access server, or several routers or access servers, designated as a buffer between any connected public networks and a private network. A firewall router uses access lists and other methods to ensure the security of the private network.

**Flood engine** Detects ICMP and UDP floods directed at hosts and networks.

**flooding** Traffic passing technique used by switches and bridges in which traffic received on an interface is sent out all the interfaces of that device except the interface on which the information was received originally.

**forwarding** Process of sending a frame toward its ultimate destination by way of an internetworking device.

**fragment** Piece of a larger packet that has been broken down to smaller units.

**fragmentation** Process of breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

**Fragment Reassembly Processor** A processor in the IPS. Reassembles fragmented IP datagrams. It is also responsible for normalization of IP fragments when the sensor is in inline mode.

**FTP** File Transfer Protocol. Application protocol, part of the TCP/IP protocol stack, used for transferring files between network nodes. FTP is defined in RFC 959.

**FTP server** File Transfer Protocol server. A server that uses the FTP protocol for transferring files between network nodes.

**full duplex** Capability for simultaneous data transmission between a sending station and a receiving station.

**FQDN** Fully Qualified Domain Name.A domain name that specifies its exact location in the tree hierarchy of the DNS. It specifies all domain levels, including the top-level domain, relative to the root domain. A fully qualified domain name is distinguished by this absoluteness in the name space.

**FWSM** Firewall Security Module. A module that can be installed in a Catalyst 6500 series switch. It uses the **shun** command to block. You can configure the FWSM in either single mode or multi-mode.

## G

**GBIC** GigaBit Interface Converter. Often refers to a fiber optic transceiver that adapts optical cabling to fiber interfaces. Fiber-ready switches and NICs generally provide GBIC and/or SFP slots. For more information, refer to the *Catalyst Switch Cable, Connector, and AC Power Cord Guide.*

**Gigabit Ethernet** Standard for a high-speed Ethernet, approved by the IEEE (Institute of Electrical and Electronics Engineers) 802.3z standards committee in 1996.

**global correlation** The IPS sensor shares information with other devices through a global correlation database to improve the combined efficacy of all devices.

**global correlation client** The software component of CollaborationApp that obtains and installs updates to the local global correlation databases.

**global correlation database** The collective information obtained from and shared with collaborative devices such as IPS sensors.

**GMT** Greenwich Mean Time. Time zone at zero degrees longitude. Now called Coordinated Universal Time (UTC).

**GRUB** Grand Unified Bootloader. Boot loader is the first software program that runs when a computer starts. It is responsible for loading and transferring control to the operating system kernel software. The kernel, in turn, initializes the rest of the operating system.

## H

**H.225.0** An ITU standard that governs H.225.0 session establishment and packetization. H.225.0 actually describes several different protocols: RAS, use of Q.931, and use of RTP.

**H.245** An ITU standard that governs H.245 endpoint control.

**H.323** Allows dissimilar communication devices to communicate with each other by using a standardized communication protocol. H.323 defines a common set of CODECs, call setup and negotiating procedures, and basic data transport methods.

**half duplex** Capability for data transmission in only one direction at a time between a sending station and a receiving station. BSC is an example of a half-duplex protocol.

**handshake** Sequence of messages exchanged between two or more network devices to ensure transmission synchronization.

**hardware bypass** A specialized interface card that pairs physical interfaces so that when a software error is detected, a bypass mechanism is engaged that directly connects the physical interfaces and allows traffic to flow through the pair. Hardware bypass passes traffic at the network interface, does not pass it to the IPS system.

**host block** ARC blocks all traffic from a given IP address.

**HTTP** Hypertext Transfer Protocol. The stateless request/response media transfer protocol used in the IPS architecture for remote data exchange.

**HTTPS** An extension to the standard HTTP protocol that provides confidentiality by encrypting the traffic from the website. By default this protocol uses TCP port 443.

## I

**ICMP** Internet Control Message Protocol. Network layer Internet protocol that reports errors and provides other information relevant to IP packet processing. Documented in RFC 792.

**ICMP flood** Denial of Service attack that sends a host more ICMP echo request (“ping”) packets than the protocol implementation can handle.

**IDAPI** Intrusion Detection Application Programming Interface. Provides a simple interface between IPS architecture applications. IDAPI reads and writes event data and provides a mechanism for control transactions.

**IDCONF** Intrusion Detection Configuration. A data format standard that defines operational messages that are used to configure intrusion detection and prevention systems.

**IDENT** Ident protocol, specified in RFC 1413, is an Internet protocol that helps identify the user of a particular TCP connection.

**IDIOM** Intrusion Detection Interchange and Operations Messages. A data format standard that defines the event messages that are reported by intrusion detection systems and the operational messages that are used to configure and control intrusion detection systems.

**IDM** IPS Device Manager. A web-based application that lets you configure and manage your sensor. The web server for IDM resides on the sensor. You can access it through Internet Explorer or Firefox web browsers.

**IDMEF** Intrusion Detection Message Exchange Format. The IETF Intrusion Detection Working Group draft standard.

**IDS MC** Management Center for IDS Sensors. A web-based IDS manager that can manage configurations for up to 300 sensors.

**IME** IPS Manager Express. A network management application that provides system health monitoring, events monitoring, reporting, and configuration for up to ten sensors.

**inline mode** All packets entering or leaving the network must pass through the sensor.

**inline interface** A pair of physical interfaces configured so that the sensor forwards all traffic received on one interface out to the other interface in the pair.

**InterfaceApp** A component of the IPS. Handles bypass and physical settings and defines paired interfaces. Physical settings are speed, duplex, and administrative state.

**intrusion detection system** IDS. A security service that monitors and analyzes system events to find and provide real-time or near real-time warning of attempts to access system resources in an unauthorized manner.

**IP address** 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as 4 octets separated by periods (dotted decimal format). Each address consists of a network number, an optional subnetwork number, and a host number. The network and subnetwork numbers together are used for routing, and the host number is used to address an individual host within the network or subnetwork. A subnet mask is used to extract network and subnetwork information from the IP address.

**IPS** Intrusion Prevention System. A system that alerts the user to the presence of an intrusion on the network through network traffic analysis techniques.

**IPS data or message** Describes the messages transferred over the command and control interface between IPS applications.

**iplog** A log of the binary packets to and from a designated address. Iplogs are created when the log Event Action is selected for a signature. Iplogs are stored in a libpcap format, which can be read by WireShark and TCPDUMP.

**IP spoofing** IP spoofing attack occurs when an attacker outside your network pretends to be a trusted user either by using an IP address that is within the range of IP addresses for your network or by using an authorized external IP address that you trust and to which you want to provide access to specified resources on your network. Should an attacker get access to your IPSec security parameters, that attacker can masquerade as the remote user authorized to connect to the corporate network.

**IPv6** IP version 6. Replacement for the current version of IP (version 4). IPv6 includes support for flow ID in the packet header, which can be used to identify flows. Formerly called IPng (next generation).

**ISL** Inter-Switch Link. Cisco-proprietary protocol that maintains VLAN information as traffic flows between switches and routers.

## J

**Java Web Start** Java Web Start provides a platform-independent, secure, and robust deployment technology. It enables developers to deploy full-featured applications to you by making the applications available on a standard web server. With any web browser, you can launch the applications and be confident you always have the most-recent version.

**JNLP** Java Network Launching Protocol. Defined in an XML file format specifying how Java Web Start applications are launched. JNLP consists of a set of rules defining how exactly the launching mechanism should be implemented.

## K

**KB** Knowledge Base. The sets of thresholds learned by Anomaly Detection and used for worm virus detection.

**Knowledge Base** See KB.

## L

**LACP** Link Aggregation Control Protocol. LACP aids in the automatic creation of EtherChannel links by exchanging LACP packets between LAN ports. This protocol is defined in IEEE 802.3ad.

**LAN** Local Area Network. Refers to the Layer 2 network domain local to a given host. Packets exchanged between two hosts on the same LAN do not require Layer 3 routing.

**Layer 2 Processor** A processor in the IPS. Processes layer 2-related events. It also identifies malformed packets and removes them from the processing path.

**Logger** A component of the IPS. Writes all the log messages of the application to the log file and the error messages of the application to the Event Store.

**logging** Gathers actions that have occurred in a log file. Logging of security information is performed on two levels: logging of events (such as IPS commands, errors, and alerts), and logging of individual IP session information.

**LOKI** Remote access, back door Trojan, ICMP tunneling software. When the computer is infected, the malicious code creates an ICMP tunnel that can be used to send small payload ICMP replies.

## M

**MainApp** The main application in the IPS. The first application to start on the sensor after the operating system has booted. Reads the configuration and starts applications, handles starting and stopping of applications and node reboots, handles software upgrades.

**maintenance partition** The bootable disk partition on IDSM2, from which an IPS image can be installed on the application partition. No IPS capability is available while the IDSM2 is booted into the maintenance partition.

**maintenance partition image** The bootable software image installed on the maintenance partition on an IDSM2. You can install the maintenance partition image only while booted into the application partition.

**major update** A base version that contains major new functionality or a major architectural change in the product.

**Malware** Malicious software that is installed on an unknowing host.

**manufacturing image** Full IPS system image used by manufacturing to image sensors.

**master blocking sensor** A remote sensor that controls one or more devices. Blocking forwarding sensors send blocking requests to the master blocking sensor and the master blocking sensor executes the blocking requests.

**MD5** Message Digest 5. A one-way hashing algorithm that produces a 128-bit hash. Both MD5 and Secure Hash Algorithm (SHA) are variations on MD4 and strengthen the security of the MD4 hashing algorithm. Cisco uses hashes for authentication within the IPSec framework. Also used for message authentication in SNMP v.2. MD5 verifies the integrity of the communication, authenticates the origin, and checks for timeliness.

**Meta engine** Defines events that occur in a related manner within a sliding time interval. This engine processes events rather than packets.

**MIB** Management Information Base. Database of network management information that is used and maintained by a network management protocol, such as SNMP or CMIP. The value of a MIB object can be changed or retrieved using SNMP or CMIP commands, usually through a GUI network management system. MIB objects are organized in a tree structure that includes public (standard) and private (proprietary) branches.

**MIME** Multipurpose Internet Mail Extension. Standard for transmitting nontext data (or data that cannot be represented in plain ASCII code) in Internet mail, such as binary, foreign language text (such as Russian or Chinese), audio, or video data. MIME is defined in RFC 2045.

**minor update** A minor version that contains minor enhancements to the product line. Minor updates are incremental to the major version, and are also base versions for service packs.

**module** A removable card in a switch, router, or security appliance chassis. The ASA 5500 AIP SSM and ASA 5585-X IPS SSP are IPS modules.

**monitoring interface** See sensing interface.

**MPF** Modular Policy Framework. A means of configuring security appliance features in a manner similar to Cisco IOS software Modular QoS CLI.

**MSFC, MSFC2** Multilayer Switch Feature Card. An optional card on a Catalyst 6000 supervisor engine that performs L3 routing for the switch.

**MSRPC** Microsoft Remote Procedure Call. MSRPC is the Microsoft implementation of the DCE RPC mechanism. Microsoft added support for Unicode strings, implicit handles, inheritance of interfaces (which are extensively used in DCOM), and complex calculations in the variable-length string and structure paradigms already present in DCE/RPC.

**MySDN** My Self-Defending Network. A part of the signature definition section of IDM and IME. It provides detailed information about signatures.

## N

**NAC** Network Access Controller. See ARC.

**NAS-ID** Network Access ID. An identifier that clients send to servers to communicate the type of service they are attempting to authenticate.

**NAT** Native Address Translation. A network device can present an IP address to the outside networks that is different from the actual IP address of a host.

**NBD** Next Business Day. The arrival of replacement hardware according to Cisco service contracts.

**Neighborhood Discovery** Protocol for IPv6. IPv6 nodes on the same link use Neighbor Discovery to discover each other's presence, to determine each other's link-layer addresses, to find routers, and to maintain reachability information about the paths to active neighbors.

**Network Access ID** See NAS-ID.

**network device** A device that controls IP traffic on a network and can block an attacking host. An example of a network device is a Cisco router or PIX Firewall.

**network participation** Networks contributing learned information to the global correlation database.

**network participation client** The software component of CollaborationApp that sends data to the SensorBase Network.

**never block address** Hosts and networks you have identified that should never be blocked.

**never shun address** See never block address.

**NIC** Network Interface Card. Board that provides network communication capabilities to and from a computer system.

**NMS** network management system. System responsible for managing at least part of a network. An NMS is generally a reasonably powerful and well-equipped computer, such as an engineering workstation. NMSs communicate with agents to help keep track of network statistics and resources.

**node** A physical communicating element on the command and control network. For example, an appliance or a router.

**Normalizer engine** Configures how the IP and TCP normalizer functions and provides configuration for signature events related to the IP and TCP normalizer.

**NOS** network operating system. Generic term used to refer to distributed file systems. Examples include LAN Manager, NetWare, NFS, and VINES.

**NotificationApp** A component of the IPS. Sends SNMP traps when triggered by alert, status, and error events. NotificationApp uses the public domain SNMP agent. SNMP GETs provide information about the general health of the sensor.

**NTP** Network Timing Protocol. Protocol built on top of TCP that ensures accurate local time-keeping with reference to radio and atomic clocks located on the Internet. This protocol is capable of synchronizing distributed clocks within milliseconds over long time periods.

**NTP server** Network Timing Protocol server. A server that uses NTP. NTP is a protocol built on top of TCP that ensures accurate local time-keeping with reference to radio and atomic clocks located on the Internet. This protocol is capable of synchronizing distributed clocks within milliseconds over long time periods.

**NVRAM** Non-Volatile Read/Write Memory. RAM that retains its contents when a unit is powered off.

## O

**OIR** online insertion and removal. Feature that permits you to add, replace, or remove cards without interrupting the system power, entering console commands, or causing other software or interfaces to shutdown.

**OPS** Outbreak Prevention Service.

## P

**P2P** Peer-to-Peer. P2P networks use nodes that can simultaneously function as both client and server for the purpose of file sharing.

**packet** Logical grouping of information that includes a header containing control information and (usually) user data. Packets most often are used to refer to network layer units of data. The terms datagram, frame, message, and segment also are used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

**PAgP** Port Aggregation Control Protocol. PAgP aids in the automatic creation of EtherChannel links by exchanging PAgP packets between LAN ports. It is a Cisco-proprietary protocol.

**PAM** Software module that provides AAA functionality to applications.

**PAP** Password Authentication Protocol. Most commonly used RADIUS messaging protocol.

**passive fingerprinting** Act of determining the OS or services available on a system from passive observation of network interactions.

**Passive OS Fingerprinting** The sensor determines host operating systems by inspecting characteristics of the packets exchanged on the network.

**PASV Port Spoof** An attempt to open connections through a firewall to a protected FTP server to a non-FTP port. This happens when the firewall incorrectly interprets an FTP 227 **passive** command by opening an unauthorized connection.

**PAT** Port Address Translation. A more restricted translation scheme than NAT in which a single IP address and different ports are used to represent the hosts of a network.

**patch release** Release that addresses defects identified in the update (minor, major, or service pack) binaries after a software release (service pack, minor, or major update) has been released.

**PAWS** Protection Against Wrapped Sequence. Protection against wrapped sequence numbers in high performance TCP networks. See RFC 1323.

**PCI** Peripheral Component Interface. The most common peripheral expansion bus used on Intel-based computers.

**PDU** protocol data unit. OSI term for packet. See also BPDU and packet.

**PEP** Cisco Product Evolution Program. PEP is the UDI information that consists of the PID, the VID, and the SN of your sensor. PEP provides hardware version and serial number visibility through electronic query, product labels, and shipping items.

**PER** packed encoding rules. Instead of using a generic style of encoding that encodes all types in a uniform way, PER specializes the encoding based on the date type to generate much more compact representations.

**PFC** Policy Feature Card. An optional card on a Catalyst 6000 supervisor engine that supports VACL packet filtering.

**PID** Product Identifier. The orderable product identifier that is one of the three parts of the UDI. The UDI is part of the PEP policy.

**ping** packet internet groper. Often used in IP networks to test the reachability of a network device. It works by sending ICMP echo request packets to the target host and listening for echo response replies.

**PIX Firewall** Private Internet Exchange Firewall. A Cisco network security device that can be programmed to block/enable addresses and ports between networks.

**PKI** Public Key Infrastructure. Authentication of HTTP clients using the clients X.509 certificates.

**Pluggable Authentication Modules** See PAM.

**POST** Power-On Self Test. Set of hardware diagnostics that runs on a hardware device when that device is powered up.

**Post-ACL** Designates an ACL from which ARC should read the ACL entries, and where it places entries after all deny entries for the addresses being blocked.

**Pre-ACL** Designates an ACL from which ARC should read the ACL entries, and where it places entries before any deny entries for the addresses being blocked.

**promiscuous delta** PD. A weight in the range of 0 to 30 configured per signature. This weight can be subtracted from the overall risk rating in promiscuous mode.

**promiscuous mode** A passive interface for monitoring packets of the network segment. The sensing interface does not have an IP address assigned to it and is therefore invisible to attackers.

## Q

**Q.931** ITU-T specification for signaling to establish, maintain, and clear ISDN network connections.

**QoS** quality of service. Measure of performance for a transmission system that reflects its transmission quality and service availability.

## R

**rack mounting** Refers to mounting a sensor in an equipment rack.

**RADIUS** Remote Authentication Dial In User Service. A networking protocol that provides centralized AAA functionality for systems to connect and use a network service.

**RAM** random-access memory. Volatile memory that can be read and written by a microprocessor.

**RAS** Registration, Admission, and Status Protocol. Protocol that is used between endpoints and the gatekeeper to perform management functions. RAS signaling function performs registration, admissions, bandwidth changes, status, and disengage procedures between the VoIP gateway and the gatekeeper.

**RBCP** Router Blade Control Protocol. RBCP is based on SCP, but modified specifically for the router application. It is designed to run over Ethernet interfaces and uses 802.2 SNAP encapsulation for messages.

**reassembly** The putting back together of an IP datagram at the destination after it has been fragmented either at the source or at an intermediate node.

**recovery package** An IPS package file that includes the full application image and installer used for recovery on sensors.

**regex** See regular expression.

**regular expression** A mechanism by which you can define how to search for a specified sequence of characters in a data stream or file. Regular expressions are a powerful and flexible notation almost like a mini-programming language that allow you to describe text. In the context of pattern matching, regular expressions allow a succinct description of any arbitrary pattern.

**Remote Authentication Dial In User Service** See RADIUS.

**repackage release** A release that addresses defects in the packaging or the installer.

**reputation** Similar to human social interaction, reputation is an opinion toward a device on the Internet. It enables the installed base of IPS sensors in the field to collaborate using the existing network infrastructure. A network device with reputation is most probably malicious or infected.

**risk rating** RR. A risk rating is a value between 0 and 100 that represents a numerical quantification of the risk associated with a particular event on the network. The risk of the attack accounts for the severity, fidelity, relevance, and asset value of the attack, but not any response or mitigation actions. This risk is higher when more damage could be inflicted on your network.

**RMA** Return Materials Authorization. The Cisco program for returning faulty hardware and obtaining a replacement.

**ROMMON** Read-Only-Memory Monitor. ROMMON lets you TFTP system images onto the sensor for recovery purposes.

**round-trip time** See RTT.

**RPC** remote-procedure call. Technological foundation of client/server computing. RPCs are procedure calls that are built or specified by clients and are executed on servers, with the results returned over the network to the clients.

**RSM** Router Switch Module. A router module that is installed in a Catalyst 5000 switch. It functions exactly like a standalone router.

**RTP** Real-Time Transport Protocol. Commonly used with IP networks. RTP is designed to provide end-to-end network transport functions for applications transmitting real-time data, such as audio, video, or simulation data, over multicast or unicast network services. RTP provides such services as payload type identification, sequence numbering, time stamping, and delivery monitoring to real-time applications.

**RTT** round-trip time. A measure of the time delay imposed by a network on a host from the sending of a packet until acknowledgment of the receipt.

**RU** rack unit. A rack is measured in rack units. An RU is equal to 44 mm or 1.75 inches.

## S

**SCP** Switch Configuration Protocol. Cisco control protocol that runs directly over the Ethernet.

**SCEP** Simple Certificate Enrollment Protocol. The Cisco Systems PKI communication protocol that leverages existing technology by using PKCS#7 and PKCS#10. SCEP is the evolution of the enrollment protocol.

**SDEE** Security Device Event Exchange. A product-independent standard for communicating security device events. It adds extensibility features that are needed for communicating events generated by various types of security devices.

**SDEE Server** Accepts requests for events from remote clients.

**Secure Shell Protocol** Protocol that provides a secure remote connection to a router through a Transmission Control Protocol (TCP) application.

**security context** You can partition a single adaptive security appliance into multiple virtual devices, known as security contexts. Each context is an independent device, with its own security policy, interfaces, and administrators. Multiple contexts are similar to having multiple standalone devices. Many features are supported in multiple context mode, including routing tables, firewall features, IPS, and management.

**Security Monitor** Monitoring Center for Security. Provides event collection, viewing, and reporting capability for network devices. Used with the IDS MC.

**sensing interface** The interface on the sensor that monitors the desired network segment. The sensing interface is in promiscuous mode; it has no IP address and is not visible on the monitored segment.

**sensor** The sensor is the intrusion detection engine. It analyzes network traffic searching for signs of unauthorized activity.

**SensorApp** A component of the IPS. Performs packet capture and analysis. SensorApp analyzes network traffic for malicious content. Packets flow through a pipeline of processors fed by a producer designed to collect packets from the network interfaces on the sensor. SensorApp is the standalone executable that runs Analysis Engine.

**Service engine** Deals with specific protocols, such as DNS, FTP, H255, HTTP, IDENT, MS RPC, MS SQL, NTP, P2P, RPC, SMB, SNMP, SSH, and TNS.

**service pack** Used for the release of defect fixes and for the support of new signature engines. Service packs contain all of the defect fixes since the last base version (minor or major) and any new defects fixes.

**session command** Command used on routers and switches to provide either Telnet or console access to a module in the router or switch.

**SFP** Small Form-factor Pluggable. Often refers to a fiber optic transceiver that adapts optical cabling to fiber interfaces. See GBIC for more information.

**shared secret** A piece of data known only to the parties involved in a secure communication. The shared secret can be a password, a passphrase, a big number, or an array of randomly chosen bytes.

**shun command** Enables a dynamic response to an attacking host by preventing new connections and disallowing packets from any existing connection. It is used by ARC when blocking with a PIX Firewall.

**Signature Analysis Processor** A processor in the IPS. Dispatches packets to the inspectors that are not stream-based and that are configured for interest in the packet in process.

**signature** A signature distills network information and compares it against a rule set that indicates typical intrusion activity.

**signature engine** A component of the sensor that supports many signatures in a certain category. An engine is composed of a parser and an inspector. Each engine has a set of legal parameters that have allowable ranges or sets of values.

**signature engine update** Executable file with its own versioning scheme that contains binary code to support new signature updates.

**Signature Event Action Filter** Subtracts actions based on the signature event signature ID, addresses, and risk rating. The input to the Signature Event Action Filter is the signature event with actions possibly added by the Signature Event Action Override.

**Signature Event Action Handler** Performs the requested actions. The output from Signature Event Action Handler is the actions being performed and possibly an evIdsAlert written to the Event Store.

**Signature Event Action Override** Adds actions based on the risk rating value. Signature Event Action Override applies to all signatures that fall into the range of the configured risk rating threshold. Each Signature Event Action Override is independent and has a separate configuration value for each action type.

**Signature Event Action Processor** Processes event actions. Event actions can be associated with an event risk rating threshold that must be surpassed for the actions to take place.

**signature fidelity rating** SFR. A weight associated with how well a signature might perform in the absence of specific knowledge of the target. The signature fidelity rating is configured per signature and indicates how accurately the signature detects the event or condition it describes.

**signature update** Executable file that contains a set of rules designed to recognize malicious network activities, such as worms, DDOS, viruses, and so forth. Signature updates are released independently, are dependent on a required signature engine version, and have their own versioning scheme.

**Slave Dispatch Processor** A processor in the IPS. Process found on dual CPU systems.

**SMB** Server Message Block. File-system protocol used in LAN manager and similar NOSs to package data and exchange information with other systems.

**SMTP** Simple Mail Transfer Protocol. Internet protocol providing e-mail services.

**SN** Serial Number. Part of the UDI. The SN is the serial number of your Cisco product.

**SNAP** Subnetwork Access Protocol. Internet protocol that operates between a network entity in the subnetwork and a network entity in the end system. SNAP specifies a standard method of encapsulating IP datagrams and ARP messages on IEEE networks. The SNAP entity in the end system makes use of the services of the subnetwork and performs three key functions: data transfer, connection management, and QoS selection.

**sniffing interface** See sensing interface.

**SNMP** Simple Network Management Protocol. Network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security.

**SNMP2** SNMP Version 2. Version 2 of the network management protocol. SNMP2 supports centralized and distributed network management strategies, and includes improvements in the SMI, protocol operations, management architecture, and security.

**software bypass** Passes traffic through the IPS system without inspection.

**source address** Address of a network device that is sending data.

**SPAN** Switched Port Analyzer. Feature of the Catalyst 5000 switch that extends the monitoring abilities of existing network analyzers into a switched Ethernet environment. SPAN mirrors the traffic at one switched segment onto a predefined SPAN port. A network analyzer attached to the SPAN port can monitor traffic from any other Catalyst switched port.

**spanning tree** Loop-free subset of a network topology.

**SQL** Structured Query Language. International standard language for defining and accessing relational databases.

**SRAM** Type of RAM that retains its contents for as long as power is supplied. SRAM does not require constant refreshing, like DRAM.

**SSH** Secure Shell. A utility that uses strong authentication and secure communications to log in to another computer over a network.

**SSL** Secure Socket Layer. Encryption technology for the Internet used to provide secure transactions, such as the transmission of credit card numbers for e-commerce.

**Stacheldraht** A DDoS tool that relies on the ICMP protocol.

**State engine** Stateful searches of HTTP strings.

**Statistics Processor** A processor in the IPS. Keeps track of system statistics such as packet counts and packet arrival rates.

**Stream Reassembly Processor** A processor in the IPS. Reorders TCP streams to ensure the arrival order of the packets at the various stream-based inspectors. It is also responsible for normalization of the TCP stream. The normalizer engine lets you enable or disable alert and deny actions.

**String engine** A signature engine that provides regular expression-based pattern inspection and alert functionality for multiple transport protocols, including TCP, UDP, and ICMP.

**subsignature** A more granular representation of a general signature. It typically further defines a broad scope signature.

**surface mounting** Refers to attaching rubber feet to the bottom of a sensor when it is installed on a flat surface. The rubber feet allow proper airflow around the sensor and they also absorb vibration so that the hard-disk drive is less impacted.

**switch** Network device that filters, forwards, and floods frames based on the destination address of each frame. The switch operates at the data link layer of the OSI model.

**SwitchApp** A component of the IPS. The IPS 4500 series sensors. have a built in switch that provides external monitoring interfaces. The SwitchApp enables the InterfaceApp and sensor initialization scripts to communicate with and control the switch.

**SYN flood** Denial of Service attack that sends a host more TCP SYN packets (request to synchronize sequence numbers, used when opening a connection) than the protocol implementation can handle.

**system image** The full IPS application and recovery image used for reimaging an entire sensor.

## T

**TAC** A Cisco Technical Assistance Center. There are four TACs worldwide.

**TACACS+** Terminal Access Controller Access Control System Plus. Proprietary Cisco enhancement to Terminal Access Controller Access Control System (TACACS). Provides additional support for authentication, authorization, and accounting.

**target value rating** TVR. A weight associated with the perceived value of the target. Target value rating is a user-configurable value (zero, low, medium, high, or mission critical) that identifies the importance of a network asset (through its IP address).

**TCP** Transmission Control Protocol. Connection-oriented transport layer protocol that provides reliable full-duplex data transmission. TCP is part of the TCP/IP protocol stack.

**TCPDUMP** The TCPDUMP utility is a free network protocol analyzer for UNIX and Windows. It lets you examine data from a live network or from a capture file on disk. You can use different options for viewing summary and detail information for each packet. For more information, see http://www.tcpdump.org/.

**Telnet** Standard terminal emulation protocol in the TCP/IP protocol stack. Telnet is used for remote terminal connection, enabling users to log in to remote systems and use resources as if they were connected to a local system. Telnet is defined in RFC 854.

**terminal server** A router with multiple, low speed, asynchronous ports that are connected to other serial devices. Terminal servers can be used to remotely manage network equipment, including sensors.

**TFN** Tribe Flood Network. A common type of DoS attack that can take advantage of forged or rapidly changing source IP addresses to allow attackers to thwart efforts to locate or filter the attacks.

**TFN2K** Tribe Flood Network 2000. A common type of DoS attack that can take advantage of forged or rapidly changing source IP addresses to allow attackers to thwart efforts to locate or filter the attacks.

**TFTP** Trivial File Transfer Protocol. Simplified version of FTP that lets files be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).

**threat rating** TR. A threat rating is a value between 0 and 100 that represents a numerical decrease of the risk rating of an attack based on the response action that depicts the threat of an alert on the monitored network.

**three-way handshake** Process whereby two protocol entities synchronize during connection establishment.

**threshold** A value, either upper- or lower-bound that defines the maximum/minimum allowable condition before an alarm is sent.

**Time Processor** A processor in the IPS. Processes events stored in a time-slice calendar. Its primary task is to make stale database entries expire and to calculate time-dependent statistics.

**TLS** Transport Layer Security. The protocol used over stream transports to negotiate the identity of peers and establish encrypted communications.

**TNS** Transparent Network Substrate. Provides database applications with a single common interface to all industry-standard network protocols. With TNS, database applications can connect to other database applications across networks with different protocols.

**topology** Physical arrangement of network nodes and media within an enterprise networking structure.

**TPKT** Transport Packet. RFC 1006-defined method of demarking messages in a packet. The protocol uses ISO transport services on top of TCP.

**traceroute** Program available on many systems that traces the path a packet takes to a destination. It is used mostly to debug routing problems between hosts. A traceroute protocol is also defined in RFC 1393.

**traffic analysis** Inference of information from observable characteristics of data flow(s), even when the data is encrypted or otherwise not directly available. Such characteristics include the identities and locations of the source(s) and destination(s), and the presence, amount, frequency, and duration of occurrence.

**Traffic ICMP engine** Analyzes traffic from nonstandard protocols, such as TFN2K, LOKI, and DDOS.

**trap** Message sent by an SNMP agent to an NMS, a console, or a terminal to indicate the occurrence of a significant event, such as a specifically defined condition or a threshold that was reached.

**Trojan engine** Analyzes traffic from nonstandard protocols, such as BO2K and TFN2K.

**trunk** Physical and logical connection between two switches across which network traffic travels. A backbone is composed of a number of trunks.

**trusted certificate** Certificate upon which a certificate user relies as being valid without the need for validation testing; especially a public-key certificate that is used to provide the first public key in a certification path.

**trusted key** Public key upon which a user relies; especially a public key that can be used as the first public key in a certification path.

**tune** Adjusting signature parameters to modify an existing signature.

## U

**UDI** Unique Device Identifier. Provides a unique identity for every Cisco product. The UDI is composed of the PID, VID, and SN. The UDI is stored in the Cisco IPS ID PROM.

**UDLD** UniDirectional Link Detection. Cisco proprietary protocol that allows devices connected through fiber-optic or copper Ethernet cables connected to LAN ports to monitor the physical configuration of the cables and detect when a unidirectional link exists. When a unidirectional link is detected, UDLD shuts down the affected LAN port and sends an alert, since unidirectional links can cause a variety of problems, such as, spanning tree topology loops.

**UDP** User Datagram Protocol. Connectionless transport layer protocol in the TCP/IP protocol stack. UDP is a simple protocol that exchanges datagrams without acknowledgments or guaranteed delivery, requiring that error processing and retransmission be handled by other protocols. UDP is defined in RFC 768.

**unblock** To direct a router to remove a previously applied block.

**UniDirectional Link Detection** See UDLD.

**unvirtualized sensing interface** An unvirtualized sensing interface has not been divided into subinterfaces and the entire interfaces can be associated with at most one virtual sensor.

**UPS** Uninterruptable Power Source.

**UTC** Coordinated Universal Time. Time zone at zero degrees longitude. Formerly called Greenwich Mean Time (GMT) and Zulu time.

**UTF-8** 8-bit Unicode Transformation Format. A variable-length character encoding for Unicode. UTF-8 can represent every character in the Unicode character set and is backwards-compatible with ASCII.

## V

**VACL** VLAN ACL. An ACL that filters all packets (both within a VLAN and between VLANs) that pass through a switch. Also known as security ACLs.

**VID** Version identifier. Part of the UDI.

**VIP** Versatile Interface Processor. Interface card used in Cisco 7000 and Cisco 7500 series routers. The VIP provides multilayer switching and runs Cisco IOS. The most recent version of the VIP is VIP2.

**virtual sensor** A logical grouping of sensing interfaces and the configuration policy for the signature engines and alarm filters to apply to them. In other words, multiple virtual sensors running on the same appliance, each configured with different signature behavior and traffic feeds.

**virtualized sensing interface** A virtualized interface has been divided into subinterfaces each of which consists of a group of VLANs. You can associate a virtual sensor with one or more subinterfaces so that different intrusion prevention policies can be assigned to those subinterfaces. You can virtualize both physical and inline interfaces.

**virus** Hidden, self-replicating section of computer software, usually malicious logic, that propagates by infecting—that is, inserting a copy of itself into and becoming part of—another program. A virus cannot run by itself; it requires that its host program be run to make the virus active.

**VLAN** Virtual Local Area Network. Group of devices on one or more LANs that are configured (using management software) so that they can communicate as if they were attached to the same wire, when in fact they are located on a number of different LAN segments. Because VLANs are based on logical instead of physical connections, they are extremely flexible.

**VTP** VLAN Trunking Protocol. Cisco Layer 2 messaging protocol that manages the addition, deletion, and renaming of VLANs on a network-wide basis.

**VMS** CiscoWorks VPN/Security Management Solution. A suite of network security applications that combines web-based tools for configuring, monitoring, and troubleshooting enterprise VPN, firewalls, network intrusion detection systems and host-based intrusion prevention systems.

**VoIP** Voice over IP. The capability to carry normal telephony-style voice over an IP-based Internet with POTS-like functionality, reliability, and voice quality. VoIP enables a router to carry voice traffic (for example, telephone calls and faxes) over an IP network. In VoIP, the DSP segments the voice signal into frames, which then are coupled in groups of two and stored in voice packets. These voice packets are transported using IP in compliance with ITU-T specification H.323.

**VPN** Virtual Private Network(ing). Enables IP traffic to travel securely over a public TCP/IP network by encrypting all traffic from one network to another. A VPN uses “tunneling” to encrypt all information at the IP level.

**VTP** VLAN Trunking Protocol. A Cisco Layer 2 messaging protocol that manages the addition, deletion, and renaming of VLANs on a network-wide basis.

**vulnerability** One or more attributes of a computer or a network that permit a subject to initiate patterns of misuse on that computer or network.

## W

**WAN** wide-area network. Data communications network that serves users across a broad geographic area and often uses transmission devices provided by common carriers. Frame Relay, SMDS, and X.25 are examples of WANs.

**watch list rating** WLR. A weight associated with the CSA MC watch list in the range of 0 to 100 (CSA MC only uses the range 0 to 35).

**Web Server** A component of the IPS. Waits for remote HTTP client requests and calls the appropriate servlet application.

**WHOIS** A TCP-based query/response protocol used for querying an official database to determine the owner of a domain name or an IP address.

**Wireshark** Wireshark is a free network protocol analyzer for UNIX and Windows. It lets you examine data from a live network or from a capture file on disk. You can interactively browse the capture data, viewing summary and detail information for each packet. Wireshark has several powerful features, including a rich display filter language and the ability to view the reconstructed stream of a TCP session. For more information, see http://www.wireshark.org.

**worm** A computer program that can run independently, can propagate a complete working version of itself onto other hosts on a network, and can consume computer resources destructively.

## X

**X.509** Standard that defines information contained in a certificate.

**XML** eXtensible Markup Language. Textual file format used for data interchange between heterogeneous hosts.

**XPI** Cross Packet Inspection. Technology used by TCP that allows searches across packets to achieve packet and payload reassembly.

## Z

**zone** A set of destination IP addresses sorted into an internal, illegal, or external zone used by Anomaly Detection.

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